MARCH
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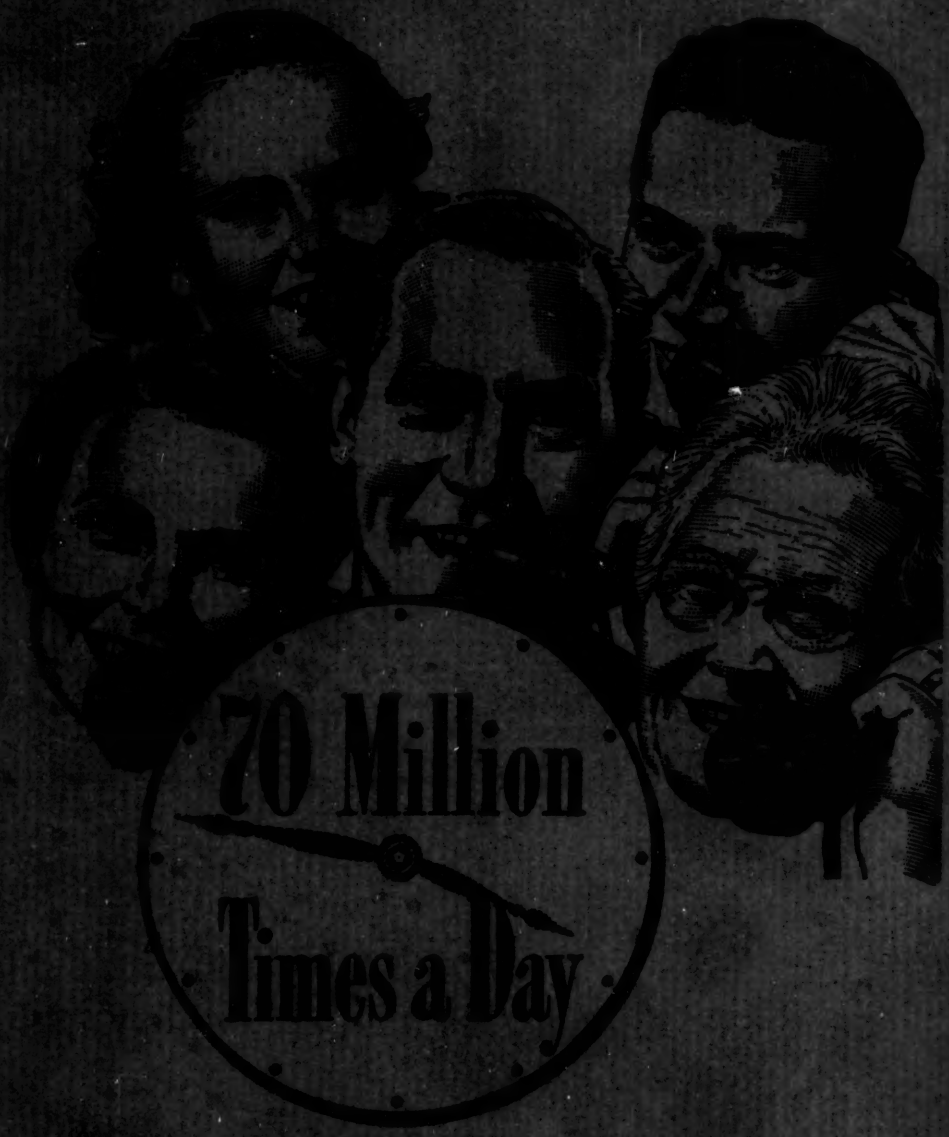

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The Journal of Higher Education MARCH, 1939

A Specialized Graduate School

By ERNEST S. GRIFFITH

What One University Has Done in Order to Capitalize on the Advantages of Its Location

IN 1935 the American University Graduate School decided to concentrate its efforts in the social sciences; now, at the end of three years it has one of the largest graduate student bodies of social science in the country. It undertook to seek experimentally, with a minimum of restraint from traditional procedures, to develop a social-science program that would meet the needs of the time and would take advantage of its location in Washington. Already the program has developed to a point where it may be of interest to readers of this JOURNAL.

The University decided to focus its graduate study in the social sciences for two reasons: depression finances forced concentration somewhere; the opportunity and need for someone to do this type of work in the Washington situation was evident. The Graduate School had already been known for its social-science work, through the work of Walter M. W. Splawn, John H. Gray, and Delos Kinsman in economics; Ellery Stowell, Irvin Stewart, and Catheryn Seckler-Hudson in political science; and Charles C. Tansill in history. Furthermore, the resources of the city of Washington, while ample in so many fields, were pre-eminently so in government, economics, and history. During the last few years the capital city had become the center of American activity in politico-economic affairs as never before, as well as a place where personalities and materials of significance in the national field could be consulted at firsthand. Furthermore, it had become a world capital, one of the relatively few places where important events were taking place in the international field. It consequently constituted a vast laboratory and reservoir of material

of incomparable possibilities for graduate study in this area. The story of the Graduate School during the past three and a half years is the story of an institution seeking to take advantage of this fortunate setting and to function within it.

Quantitatively, the results have been remarkable. For the third successive year, the American University as a whole has shown the highest percentage of growth in registration of any college or university listed in the annual compilation of the *New York Times*. The students in social science in the Graduate School and the affiliated graduate division of the School of Public Affairs have increased from 70 in 1934–35 to 670 in the current academic year. The full-time students have increased from a negligible number to approximately one hundred during the same length of time and furnish the majority of course registrations in history, political science, international affairs, and politico-economic relations. They include residents of twenty-six states and seven foreign countries.

At the same time, standards of admission have been steadily advanced. Students desiring admission to the Graduate School are now required to present an honor average as undergraduates in the field in which they wish their degree, or satisfactory graduate work at another institution.

OF MORE general interest and educational significance is the actual curriculum as it is now developing. There seemed to be no rational justification for "just another graduate school" which would duplicate the work already offered by other and much better supported universities. Our problem was to think through the implications of unique elements in the Washington setting.

In the first place, it was perfectly obvious that traditional departmental lines did not coincide with the organization of activities. Whether or not these traditional departmental categories furnished the most useful approach was seriously questioned. In Washington the characteristic opinion assumed by those in the field was not that of a department but of a focus of interest. For example, the relations of government to business, international relations or affairs in the broadest sense of the term, the administrative process, social security, human welfare, and national resources were regarded as the great, preoccupying problems; and each of these drew important subject-matter from a number of disciplines. This indicated the possibility that a student might concentrate his interest at any point he desired, and then broaden and deepen his study in whatever direction was necessary in order to understand the area of his central concern. For such an objective, departmentalization in the usual sense might easily be a handicap.

Certain fields or sequences of graduate study suggested themselves almost immediately. "International affairs" was one, and a program was constructed that included international law, relations, and economics, and diplomatic history. Eventually this is to be buttressed by a sociological understanding of those factors which make for or obstruct the flow of ideas

from nation to nation. The interrelations of government and economics, including not merely government control of businesses but the impact of economic forces upon government, proved another convenient focus. Still another group of students found themselves interested primarily in the impact of the social and economic order upon the individual, and for them a sequence in social economy was formulated.

The requirements for the doctorate in "Social Economy" include first, basic grounding in two general fields, chosen from among economics, sociology, cultural anthropology, social and economic history, social psychology, and political science. "Basic grounding" is understood to include a descriptive knowledge of the American situation, understanding of the main outlines of theory in the field, and critical application of theory to observed conditions. The second requirement is a combination of work in the area of a student's special interest which shall include theoretical background, detailed familiarity with one or more specific problems or areas, and technical knowledge of the research or administrative aspects. Three areas in some detail are suggested: social engineering, culture and personality, and the social services. Combinations in other areas may be offered by individual students. In the area of social engineering, theoretical background includes social psychology, community institutions, and principles of social and economic planning; specific problems include population, land economics, housing, public health, labor conditions and standards, and welfare services; technical knowledge includes municipal administration, public finance and social accounting, and methods of social research. In the area of culture and personality, theoretical background includes social psychology, community institutions, cultural conditioning and cultural change; specific problems include standards of living, urbanization, population problems, minority groups, and personality development; technical knowledge includes research techniques in fields of culture and of personality and the techniques of group adjustment and of individual adjustment. In the area of the social services, theoretical background includes the principles underlying the provision of social services—interrelations among services, private versus public operation, insurance versus grants, alternative sources of funds; special problems include the provision of crime control, social legislation, and the relation of the social services to labor standards or to personality development; technical aspects include the basic administrative processes applied to the administration of welfare programs or of social insurance and methods of social research.

Whatever the area of a student's special interest, he is expected to develop certain types of equipment. Requirements in this respect may be met by undergraduate record, graduate courses, or by examination. He must be familiar with the variety of research techniques upon which findings in the field of social economy rest, and have real competence in the use of the techniques which are most

appropriate to the area of his special interest. He must be able to apply the perspective and methods of history to the problems studied, to analyze the structure and functioning of economic and social institutions, and to view a culture as a whole. He must be familiar with the psychologists' findings on the development of personality in our culture.

"National resources" seemed a logical title for the field dealing with land utilization, mineral and power economics, and the relationships of population to each of these and to production generally. Under the direction of the affiliated School of Public Affairs "public administration" is the center of a student's interest, and no degree is granted by this School unless public administration includes also an "area of application" such as transportation, social security, or the like. Programs are of course also formulated and degrees granted within the more orthodox categories of political science, economics, and history, where a wealth of material is likewise available.

COURSES are devised and faculty selected primarily to ensure that material as presented shall represent an awareness of the contributions made by other disciplines to the subject-matter under discussion. The names of a few seminars may be given by way of illustration: "The Sociological Approach to Government," "World Economics," "Economic Co-ordination in a Democracy," "The Problem of Constitutional Revision," and "Fiscal Policy" are a few. Members of the faculty are selected because of their recognized competence in more than one field.[1]

In the program in history this emphasis upon interrelations has had interesting results. Economic history is elevated to a status whereby it constitutes a field in itself, with an appropriate sequence of courses. To enrich history in its more general interpretation, the knowledge of the major contributions of at least one of the other social sciences is deemed essential so that thereby a student may have a conceptual tool to facilitate and enrich his analysis of the past. Integrated programs are worked out for each student. One such program will make this more concrete:

For the Ph.D. a student primarily interested in American social history might choose: history of the United States, history of Europe, the frontier in American and European history, United States from 1865 to 1900, the process of urbanization in the 19th and 20th centuries, European and American social research, and institutional economics.

This approach also has its counterpart in specific courses, many of which are designed to explore the implications of another discipline to historical material. "The Rise of European Nationalism" ties in with political theory; "The Development of American Culture" utilizes the approach of cultural anthropology; "The History of Modern Russia" is taught by a geographer and engineer. This is not to say that the indis-

[1]This holds true of the majority of the persons recently who have been appointed to the faculty of the American University—scholars such as Leon C. Marshall, Frank Lorimer, Caroline Ware, F. K. Mann, L. C. Gray, O. E. Baker, G. C. Means, Ralph Turner, Ewan Clague, and W. C. Huntington.

pensable core of the historical method is neglected. For example, the seminar in "American Historiography" is given by Solon J. Buck, director of publications of the National Archives; and intensive courses in specific periods and of definite regions are available.

The question naturally occurs as to whether the addition of degree sequences such as national resources, economic history, and the like does not mean a departmentalization run riot, and the splitting of the faculty into minute groups. As a matter of fact, such a state of affairs is avoided by the faculty's own outlook as already indicated. Furthermore, each faculty member finds himself a member of the committee or faculty of all special sequences or departments to which his course or courses are definitely significant. Hence, the average professor is a member of two or three or four such fields or sequences, and in this fashion tends to become centrifugal rather than centripetal in his outlook. Also, each field is correspondingly enriched by the resultant interchange of ideas.

THE peculiar coloration of the work of the School through its location in Washington is not confined to an awareness of the interrelations of the various social-science disciplines. In part this awareness of interrelations is itself a by-product of the nature of governmental action. Essentially such action is situational in that it deals with a problem in all its aspects—political, economic, technological, geographical, cultural, and the like—rather than with a theoretical formulation of principles in a single discipline. This constant emphasis on problems lends a realism, a concreteness, to the intellectual climate of the city. One might phrase the functions of a graduate school in such an environment as both the acquisition of scholarly realism and the vesting of the concrete with a philosophical significance.

Foremost among the devices adopted by the Graduate School is the enlisting of the services of about one hundred carefully selected government experts for the conduct of courses and seminars in the field of their specialty.[2] For the most part these men have at some time or other themselves been members of college faculties, and they are aware of the responsibilities involved. Furthermore, the majority of them have continued their research since joining the government, in many instances as heads of research bureaus of such size of staff and equipment that no college professor even in his wildest dreams ever imagined the like at his disposal. Furthermore, because this research so often is designed to furnish a basis for legislation, into it is injected the quality of responsibility.

This quality is analogous to the test of experience in business. It is usual to point out that the hard logic of the market sifts the wheat from the chaff in practical business decisions, while the scholar seldom has an

[2]Approximately one-half of the courses are conducted in this fashion. One must at once recognize certain disadvantages attendant upon such widespread use of a part-time faculty. The primary loyalty lies elsewhere, and consequently an uneveness of preparation and an occasional use of substitutes may have a somewhat disrupting effect upon the course. Furthermore, these teachers necessarily meet their classes in the late afternoon or evening.

operative check on his conclusions. Such is not the case in Washington. The accuracy of the findings of the research division of the Federal Reserve Board or the Treasury may make or break a depression. The policies generated from the findings of the bureau of research and statistics of the Social Security Board contain within them the welfare and happiness of millions of individuals, not to mention their impact upon the structure of American business. In agencies such as the Federal Trade Commission, the Interstate Commerce Commission, and the Tariff Commission, facts are uncovered and reports are prepared which may be decisive in the character of our economic order. One might continue such a list indefinitely, and tell the story of agriculture, of labor, of the causes of crime, but enough has been said to indicate the magnitude of the issues at stake and the difference in kind between governmental and most private research. The former finds itself translated into administration and legislation, and as such must stand the cold, relentless test of experience.

Furthermore, the recommendations of a governmental research bureau must always, if they are to be successful, pay due regard to the climate of opinion and the cultural setting. Naturally this has its bad as well as its good side; but the world has need of this type of scholar to solve its immediate problems, as well as those whose influence may be felt more profoundly in the distant future.

A by-product lies in the opportunities presented to the students themselves for contacts with the government and for research in similar problems under appropriate direction. In part, this works itself out in term papers or "creative workshop" projects in connection with specific courses—projects which involve use of the facilities of the government departments. The advanced statistical work in the School is wholly of this character, and is largely on an individual basis.

The most serious effort to capitalize on these facilities, however, lies with the theses—Masters' as well as Doctors'. Some titles taken at random will illustrate:

The Distribution of Federal Funds for Unemployment Relief (in connection with the *WPA*)

Independent Unions Formed since the Passage of the Wagner Act (in connection with the National Labor Relations Board)

Denial of Citizenship by Naturalization in the United States Because of Lack of Good Moral Character: A Study of a Selected Group of Cases (in connection with the Bureau of Immigration and Naturalization)

The Railway Labor Problem in the United States: Public Regulation of Hours of Service of Railroad Employees (in connection with the Interstate Commerce Commission and the National Mediation Board)

Stumpage Prices in the United States (in connection with the United States Forest Service)

Application of the Principles of Risk and Risk-Bearing to Home-Mortgage Lending (in connection with the Federal Housing Administration and the Federal Home Loan Bank)

Apart from its influence on research, the infusion into the Graduate School of so many faculty members with practical experience of this type

affects the tone and methods of the School in a number of ways. Most striking is probably the "sense of significance" imparted to the classroom material. It is not unusual for a classroom to sense the formulation of actual policy in the content of a course. Illustrations are fresh and striking; discussion is up-to-date and concrete.

One does not need to argue that all graduate work should be of this character to urge that there is a place in American higher education for at least one school that seeks to exploit to the limit this type of study and research. If we are to believe the pedagogues, then the vitality and realism of the material itself will in no small measure contribute to the full development of the minds that are brought to bear upon it.

A word of caution is needed in conclusion. A danger of Washington lurks in the very advantages of the city. Unless properly safeguarded, a preoccupation with the "here and now" will blind one to the long-range and more fundamental elements in social science. The faculty is aware of this danger, and its full-time members in particular regard themselves as the custodians of the values derivative of social theory. To the extent to which the School succeeds in fusing the perspective of theory with the immediate problems facing our present age it will make a genuine place for itself in American graduate work.

The Education of the Younger Starred Scientists

By STEPHEN S. VISHER

Educational Trends Revealed by Contrasts with the Older Groups

A SUMMARY as to the education of the two hundred fifty scientists first starred, by vote of their fellow specialists as distinguished in research, in the sixth edition of Cattell's *American Men of Science* issued last August, is of interest, as is brief discussion of some of the changes in the education of the younger starred scientists as compared with those selected earlier. The present discussion is somewhat comparable to studies made by Cattell of the older groups[1] and to one made by the present writer in this JOURNAL.[2]

The two hundred fifty most recently starred scientists received their undergraduate training in more than 120 colleges. Only eleven conferred the Bachelor's degree on four or more of the subsequently starred scientists who tell where they obtained their first degrees: Harvard, 14; California and Michigan, 10; Chicago, 9; Princeton, 7; Yale and Cornell, 5; Massachusetts Tech., Northwestern, Pennsylvania, and Stanford, 4. The following graduated three each: Albion, Amherst, Brown, Columbia, Hopkins, Illinois, Iowa State, Minnesota, Missouri, Ohio, and Washington (Seattle). Institutions which graduated two were Bowdoin, Bryn Mawr, Goucher, Indiana, Kansas, Rutgers, Swarthmore, St. Louis, Toronto, and Wisconsin.

The leading institutions in the undergraduate training of the five hundred younger starred scientists (those starred in 1932 or 1937) with the number of Bachelors from each were Harvard, 33; Chicago, 23; Michigan, 18; California and Cornell, 14; Princeton, 13; Columbia, Illinois, and Yale, 10 (the sum of Columns 3 and 4 of Table I).

As compared with the one thousand starred in 1903, the five hundred starred in 1932 or 1937 came more largely from small institutions. More than a third of those of the 1903 selection who had American Bachelors' degrees came from eight large universities: Harvard, 106; Yale, 52; Michigan, 35; Cornell, 31; Columbia, 28; Hopkins, 27; Massachusetts Institute of Technology, 26; and Princeton, 23. These eight supplied only two-thirds as large a proportion of the five hundred younger men. The fact that a total of 154 American colleges graduated one or more of the seven

[1] Published in the appendices of *American Men of Science*. Lancaster, Pennsylvania: Science Press.

[2] "Starred Scientists," JOURNAL OF HIGHER EDUCATION, II (February, 1931), pp. 78–80.

hundred fifty younger starred scientists is evidence of the widened interest in science. There were almost as many colleges in the United States in 1890 as in 1920, but at the earlier date science instruction was meager in most of the smaller schools and research was seldom encouraged.

A second noteworthy change in the place of undergraduate training of the five hundred younger starred scientists as compared with the thousand older ones is that there has been a decline in the East, a considerable gain in the Midwest, and a sharp rise in the West. For example, the chief colleges of New England graduated only about half as many proportionately and the chief institutions of the Middle Atlantic, including Hopkins, only about two-thirds as many. The ten institutions of the Middle West which had graduated two or more of the earlier group yielded about 25 per cent more of the younger group. The gain of Chicago has been spectacular: twelve times as many baccalaureate graduates are among the five hundred younger men as among the thousand older ones. Similarly, although the colleges of the Pacific Coast graduated only about 14 of the thousand older starred group, they yielded 38 of the younger five hundred, or about five times as many proportionately. The institutions of the Rocky Mountain states graduated 13 of the younger five hundred, a large number in proportion to college population. The

TABLE I

COLLEGES WHICH CONFERRED THE BACHELOR'S DEGREE UPON FOUR OR MORE SCIENTISTS

	First Starred in				First Starred in		
	1927	1932	1937		1927	1932	1937
(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Albion	1	.....	3	Michigan	7	8	10
Amherst	5	2	3	Minnesota	6	5	3
Brown	2	1	3	Missouri	4	3	3
California	7	4	10				
Chicago	11	14	9	Nebraska	3	2	.....
				North Carolina	2	1	1
Colorado	2	2	1	Northwestern	.....	1	4
Columbia	4	7	3	Ohio	5	3	3
Cornell	6	9	5	Pennsylvania	6	2	4
Dartmouth	3	2	1				
Denver	.....	2	2	Pomona	1	1	2
				Princeton	4	6	7
Harvard	20	19	14	Stanford	6	3	4
Illinois	3	7	3	Syracuse	2	2	.....
Indiana	2	1	2	Valparaiso	2	1	1
Iowa State	1	1	3				
Johns Hopkins	4	2	3	Washington	.....	1	3
				Western Reserve	2	1	1
Kansas	7	2	2	Wisconsin	9	1	2
Massachusetts Tech	7	2	4	Wooster	1	1	2
				Yale	2	5	5

South, that is, south of Maryland, graduated 19 of the younger five hundred, the University of North Carolina being the only one to yield two. In proportion to college population, the South produced fewer subsequently starred scientists than any other section. Since information is not available as to what proportion of the thousand starred men of the 1903 selection graduated in the South, the change in productivity from 1903 to 1933 and to 1938 cannot be given here. Of the 601 starred in 1921 or 1927, however, the South graduated 23, which is at almost precisely the same rate as that for the five hundred starred in 1932 or 1937. Of the 601, Peabody, North Carolina, and Kentucky graduated three; Texas, four.

SIGNIFICANT changes in the number of baccalaureate graduates who have subsequently been starred occurred for some schools. For example, of the five hundred younger scientists, Hopkins graduated only about 40 per cent—as many relatively as for the thousand oldest ones; Yale only half as many; and Harvard 60 per cent as many. The decline for Columbia and Pennsylvania is about 30 per cent. Cornell, however, has had almost no decline, and Princeton and Michigan graduated slightly more proportionately of the younger than of the older thousand men. The University of California, with 21 of the last seven hundred fifty as compared with 12 of the first thousand, has made a sharp advance; Stanford, with 13 of the later group as compared with only one of the earlier group, has done very well indeed.

The fluctuation from time to time in the yield of graduates who later may become distinguished depends upon two main factors, material and stimulation. Even in the larger schools, the number of students with the possibilities of becoming distinguished investigators varies. It seems apparent, however, that the variation in faculty personnel is of greater import. For example, David Starr Jordan stimulated many men at Indiana University and then at Stanford to become distinguished zoölogists; after he left Indiana, his influence was effectively perpetuated for a time by Eigenmann. John A. Miller, then at Indiana University, graduated four men subsequently starred in astronomy. In the many years since he left none has appeared. Indiana University has not yet graduated a chemist who has been starred despite a relatively large chemistry department for many decades. Kansas, under Bailey, graduated several; DePauw, with enthusiastic Blanchard, graduated three men who were later starred in chemistry. Although no botanist subsequently starred has graduated at Indiana University since Campbell and Coulter left, Wabash College, with Thomas, graduated four.

In addition to the profound influence of individual teachers, the effect of the age of the president and faculty appears often to be important. For example, at Indiana University, from 1901 to 1906, twelve men subsequently starred were graduated. Since 1906, only one subsequently starred man received the Bachelor's degree. What happened about 1901 to cause this outburst of scientific

interest? The answer appears to be that W. L. Bryan, a young scientist, became president in 1902, with a faculty consisting largely of young men, many of whom were hopeful of the new administration. A graduate school was started, the more capable students were enabled to continue for their Masters' degrees and were stimulated to go elsewhere for the doctorate and into research. Why the decline after about 1907? Apparently because, as so often happens with new administrations, the early promises were not fulfilled, hopes faded, discouragement grew, enthusiasm for research declined. With no change in administration until 1937 and with the departmental heads aging until in 1937 most of them, as well as the president and several deans, were in the seventies or almost there, no revival took place.

The decline at certain other universities apparently was similarly associated with the aging of the president and many of the dominant members of the faculty. Examples are Wisconsin under President Van Hise and Michigan under President Angell. The coming to the presidency of Michigan of a young enthusiastic scientist apparently helps to explain Michigan's gain in starred alumni of the 1932 and especially of the 1937 groups as compared with the 1921 group. The evidence as to the vital importance of young, hopeful, enthusiastic presidents and faculty upon the yield of graduates who later become distinguished in research is perhaps not adequate as yet, but certainly it is suggestive.

Of the persons recently starred, most of them received the doctorate in the 16 institutions listed in Table II, but 32 additional universities conferred the doctorate upon one or more of the two hundred fifty starred in 1937. Among the starred scientists in 1937 are many who were not born in the United States and who were not educated here. For this reason the 32 institutions are listed in two classes, native and foreign. The names of the 32 institutions with the numbers of Doctors' degrees granted are:

	Number of Degrees
Berlin	8
Göttingen	7
Breslau, Leiden, Leipzig, Heidelberg	3
Groningen, Munich, Vienna	2
Brown, Bryn Mawr, George Washington, Iowa	2
Berne, Budapest, Cambridge, Edinburgh, Ottawa, Oxford, Rome, St. Petersburg, Stuttgart, Toronto, Utrecht, Wurzburg, Zurich	1
Northwestern, Pittsburgh, Rice, Rochester, Virginia, Virginia Tech	1

WITH respect to the doctorate, four changes between the thousand selected for starring in 1903 and the younger starred men are evident: First, a larger percentage of the younger men have the Doctor's degree; all but 8 of the two hundred fifty starred in 1937 in contrast to only about one-half of the thousand. Second, a much larger number of institutions have conferred the degree. Third, in relative importance, Hopkins has fallen from first place to fourth for the last five hundred and to a tie for fifth for the last two hundred fifty. Of the first thousand, Harvard conferred the doctorate on only about half as many as did Hopkins, but on more than twice as many of the younger men.

Harvard's dominance is now challenged by Chicago. Columbia had third place in the 1927 and 1932 groups, but for the youngest (1937) group, California surpassed Columbia, tied with Chicago, and was close behind Harvard. Fourth, there has been a sharp decline in the number of foreign doctorates received by native Americans. More than a fourth of those starred in 1903 who had doctorates had German degrees. Not one native American of the 1937 group has a German degree; only one has a foreign degree and that is from Oxford.

TABLE II

DOCTORATES HELD BY STARRED SCIENTISTS

STARRED IN	1927	1932	1937	STARRED IN	1927	1932	1937
(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
California	6	13	21	Massachusetts Tech.	2	.....	5
California Tech.	.....	2	10	Michigan	1	2	9
Chicago	34	30	21	Minnesota	4	3	3
Columbia	24	22	19	Pennsylvania	12	2	4
Cornell	7	11	10	Princeton	3	12	7
Harvard	30	42	24	Stanford	1	1	5
Hopkins	24	14	11	Wisconsin	3	7	7
Illinois	4	9	3	Yale	11	12	13

The rank of particular departments is of interest to specialists. Table III shows the doctorates conferred on men subsequently starred for each of the twelve sciences in which stars are given, for each of the major universities, for each of the last four starrings.

Table III may advantageously be summarized. The leading departments in the training of the younger starred anatomists have been Chicago, Harvard, Hopkins, and Michigan. Columbia and Harvard have leadership for the younger anthropologists. In astronomy, California, Chicago, and Princeton are conspicuous. In botany, Chicago leads, followed at some distance by Harvard, Hopkins, Columbia, and Cornell. The younger starred chemists have come from many institutions, with California, Chicago, and Harvard in the lead. In geology, Yale, Chicago, California, and Harvard are the big four. In mathematics, Chicago, Harvard, and Princeton stand highest. In pathology, Hopkins leads, followed by Columbia and Harvard. In physiology, Chicago leads, followed by Harvard, Hopkins, and Pennsylvania. In physics, Chicago, Princeton, Harvard, Hopkins, California Tech., and Columbia are all prominent. In psychology Columbia has led recently, followed by Harvard and Chicago. In zoölogy, Harvard and Columbia now have a wide lead over Chicago, Cornell, and Hopkins.

Changes in the departmental doctoral training of the younger starred scientists as compared with the older ones, those starred in 1903, have been drastic. In the 1903 group, Hopkins

had conferred the doctorate upon the largest number of representatives of eight of the twelve sciences, tied for first in two sciences, and tied for second in another. In the doctoral training of the younger starred men, however, it leads only in pathology, stands second in physiology, is tied for second in anatomy, stands third in botany and physics, is tied for fourth in zoölogy, and stands even lower in the other six sciences. Harvard led only in anthropology and botany in the doctorates in the 1903 selection. Although it has lost leadership in these two, it leads for the younger scientists in mathematics and zoölogy and stands close to the top in most of the sciences except astronomy. Chicago had no clear first place in 1903; but for the 601 starred in 1921 or 1927 it led in two, tied for first in two, and ranked second in four. From the number of graduates recently starred, it appears that when they were being trained, Chicago led or was very close to first with respect to anatomy, astronomy, botany, chemistry, geology, mathematics, physiology, physics, and psychology. In zoölogy it was third and in pathology, fourth. Only in anthropology and pathology did it fail to place among the three leading universities.

The shift of leadership from Hopkins to Harvard, with Chicago in a challenging position, is not the only migration. Two California institutions have forged to the front lately. The University of California leads in the advanced training of the younger astronomers and younger chemists and has high place for geologists. The California Institute of Technology trained more of the youngest starred physicists than any other university, and stood second in the number of young chemists.

A CHANGE of status in degree-granting has appeared also between the state-supported and the privately endowed universities. State universities conferred the Bachelor's degree on only about 86 of the one thousand men starred in 1903. Of the last seven hundred fifty starred, however, state universities graduated 176 or nearly three times as many proportionately.

For their doctorates, only 25 of the thousand scientists starred in 1903 received the Ph.D. or M.D. from a state university. Of the five hundred scientists starred in 1932 or 1937, however, 91 received their doctorate from a state university, not including Cornell and the University of Pennsylvania, both of which now receive considerable shares of their incomes from the state governments. Thus, fully seven times as large a proportion of the younger starred scientists have doctoral training from state universities as for the older (1903) group.

The University of California is the only state university to take leadership in the training of particular groups of scientists. Its position with respect to astronomers and chemists and its high rank for geologists were mentioned in an earlier paragraph. The University of Michigan holds a relatively high rank in three subjects; Wisconsin and Illinois have had enviable records in one or two sciences. Virginia has done better than Harvard in training astronomers.

TABLE III

DOCTORATES CONFERRED ON SCIENTISTS STARRED IN YEAR INDICATED

	ANATOMY	ANTHROPOLOGY	ASTRONOMY	BOTANY	CHEMISTRY	GEOLOGY	MATHEMATICS	PATHOLOGY	PHYSICS	PHYSIOLOGY	PSYCHOLOGY	ZOOLOGY	TOTAL
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
California													
1937	.....	1	4	.....	10	4	1	.....	1	.....	.....	.....	21
1932	.....	.....	3	2	3	.....	.....	.....	3	.....	.....	2	13
1927	.....	.....	1	1	2	2	.....	.....	.....	.....	.....	.....	6
1921	.....	.....	3	.....	.....	2	.....	1	.....	.....	.....	1	7
California Tech.													
1937	.....	.....	.....	.....	4	.....	1	.....	5	.....	.....	.....	10
1932	.....	.....	.....	.....	1	.....	.....	.....	1	.....	.....	.....	2
Chicago													
1937	.....	.....	1	6	3	4	1	1	1	2	1	1	21
1932	1	.....	2	4	4	5	4	2	3	.....	1	4	30
1927	1	.....	2	5	3	2	3	1	7	3	3	4	34
1921	1	.....	2	1	6	8	7	2	1	3	4	5	40
Columbia													
1937	.....	1	.....	.....	2	.....	.....	4	3	1	3	5	19
1932	.....	3	.....	.....	5	1	1	3	2	.....	2	5	22
1927	.....	2	.....	6	2	1	3	1	1	.....	4	4	24
1921	.....	1	.....	1	2	4	.....	3	3	2	3	7	26
Cornell													
1937	1	.....	.....	2	2	1	.....	.....	1	.....	.....	3	10
1932	.....	.....	1	3	1	.....	.....	.....	2	.....	1	4	11
1927	1	.....	.....	1	4	.....	.....	.....	1	.....	.....	.....	7
1921	.....	.....	.....	1	.....	4	3	.....	2	.....	2	3	15
Harvard													
1937	.....	2	.....	3	3	1	2	5	.....	.....	3	5	24
1932	2	2	.....	4	4	5	6	2	2	3	2	10	42
1927	.....	.....	.....	2	4	3	3	2	6	3	1	6	30
1921	1	2	.....	3	7	.....	5	.....	3	.....	2	5	28
Hopkins													
1937	.....	.....	.....	2	.....	2	.....	2	3	1	.....	1	11
1932	1	.....	.....	3	1	3	.....	5	.....	.....	1	.....	14
1927	1	.....	.....	2	3	2	.....	4	4	3	1	4	24
1921	3	.....	2	1	5	1	.....	10	5	2	.....	5	34
Illinois													
1937	.....	.....	.....	.....	1	.....	.....	.....	.....	1	.....	1	3
1932	.....	.....	.....	.....	5	1	.....	.....	.....	.....	.....	3	9
1927	.....	.....	.....	.....	1	1	1	1	.....	.....	.....	.....	4
1921	.....	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	2

TABLE III [*Continued*]

TABLE III [*Continued*]

	Anatomy	Anthropology	Astronomy	Botany	Chemistry	Geology	Mathematics	Pathology	Physics	Physiology	Psychology	Zoology	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Massachusetts Tech.													
1937					2				3				5
1927					1	1							2
1921					1				1				2
Michigan													
1937	2			2	2			1	1	1			9
1932			1						1				2
1927										1			1
1921				2	1				3	1			7
Minnesota													
1937						1			1		1		3
1932	1				1						1		3
1927			1	1					2				4
1921				3	1				2				6
Pennsylvania													
1937				2			1			1			4
1932				1							1		2
1927					3			2	2	2		3	12
1921		1		1	4			2	1	1			10
Princeton													
1937			1		2	1	1		2				7
1932			2		4		1		5				12
1927							2		1				3
1921	1		2		1		3		4				11
Stanford													
1937				1		1					2	1	5
1932									1				1
1927												1	1
1921					2							2	4
Wisconsin													
1937				2	2		1					2	7
1932				2		1			1	2	1		7
1927		1			1				1				3
1921				2	2							1	5
Yale													
1937				1	3	4				1		4	13
1932					2	5			3		1	1	12
1927	1	1			1	5						3	11
1921				1	2	6		3	3	2			17

With the huge public funds for buildings and maintenance, and the enormous enrollments, the state universities have some advantages in the training of scientists over even the most favored private institutions. The rivalry between the two often is beneficial. It is often said: "The best thing which ever happened to the University of California was the establishment of Stanford University," and "the University of Illinois has been much benefited by the rivalry with the University of Chicago."

IN THE Preface to the sixth edition of *American Men of Science*, Cattell remarks: "The United States has attained in a single generation a position of leadership among the nations in its contributions to the advancement of science and to human welfare." No longer must ambitious American scientists go to foreign countries for their training. Instead, hundreds of foreigners have come to America for advanced education.

Approximately two-thirds of the thousand scientists selected for starring in 1903 had studied in Germany; of the two hundred fifty scientists starred in 1937, less than one-fifth have studied in Germany, and more than half of these were born in Europe; as already remarked, not a single native American starred in 1937 has a German doctorate, a sharp change from 1903 when about a fourth of the doctorates were from Germany. The inclusion among the two hundred fifty of 1937 of 58 persons born in Europe, as well as 11 born in other foreign lands means, however, that although relatively few American scientists are now doing much formal studying in Europe, America still continues to receive much educational benefit therefrom.

Almost a third of the two hundred fifty scientists most recently starred have held post-doctoral fellowships. In three of the sciences, chemistry, mathematics, and physiology, slightly more than one-half of the newly starred men have held post-doctoral fellowships, chiefly National Research Council Fellowships. More than one-third of the physicists and zoölogists, a fourth of the astronomers and psychologists, and a fifth of the anatomists and anthropologists have had corresponding fellowships, but only about one-eighth of the pathologists and geologists, and a twelfth of the botanists.

Institutions at which post-doctoral fellowships were spent by recently starred scientists include Harvard, 9; California Institute of Technology, 8; Yale, 7; Princeton, 6; California, 6; Hopkins, 4; Chicago, 3; Michigan and Columbia, 2; with one each at Iowa, Pennsylvania, Rice, Massachusetts Institute of Technology, and Ohio State.

Nineteen of the two hundred fifty have held post-doctoral fellowships for two or more years, ten have held Guggenheim fellowships; five have received both the M.D. and the Ph.D. degrees. Twenty of the two hundred fifty state that they studied in Europe on post-doctoral fellowships; sixteen who were born in Europe studied in America on post-doctoral fellowships.

Developing a College through Research

By C. GILBERT WRENN

Description of the Four Research Areas Investigated by the General College, University of Minnesota

THERE are at least four areas of research in which a college must make progress if it develops its program upon a basis of fact: first, research leading to a more adequate curriculum, a curriculum designed to meet its students' contemporary and concrete needs; second, research upon methods of determining individual student achievement and growth; third, research upon the need for student personnel services and the direction of extra-classroom development; and fourth, research upon college administrative problems, the validation of organizational structure, and the nature of change in regulations. There are but few colleges in which this fourfold research program is the basis of development of the institution. To draw illustrations from one college, the General College of the University of Minnesota, is not to suggest that it stands alone in this regard, but, the truth to tell, there are not many colleges which have been able to develop a program, unencumbered by tradition and aided by research vision and funds.

The General College opened in 1932 as a unit of the University of Minnesota designed both to serve the needs of the undecided and nonacademic student and to engage in educational research. It has been accorded research support by President Coffman from the beginning but, starting in 1934, the College began to obtain other research funds. Since that time it has had two grants from the General Education Board, totaling $131,000, a grant of $20,000 from the Carnegie Corporation, and a special grant for visual-education production in the College and in the University of $122,000, a total of something more than a quarter of a million dollars.

This prelude to a discussion of research in the General College must give credit to the presence at the University of Minnesota of the University Committee on Educational Research. This rather unique research agency has, since its inception in 1924, engaged in hundreds of research projects at the university level. The General College through this Committee was able to approach many research problems, particularly studies of examinations and the measurement of student achievement. The Com-

mittee, however, has in its files scores of published and unpublished research studies in the field of student personnel work, somewhat fewer in the field of college and university administration, and a considerable showing in the realm of curriculum revision. The College found this Committee a bulwark of research knowledge and encouragement. Nor should be forgotten the supporting research in the University Board of Admissions and the University Testing Bureau, both agencies having attacked a prodigious number of research problems during the past five years.

The curriculum research of the General College has from the beginning divided itself into two categories, research upon the effectiveness of the materials and methods of existing curriculum areas which must serve the constant flow of students in and out of the College, and, second, basic research which strikes at the heart of student needs and characteristics, both present and future. Research upon existing course content and teaching method has been continuous and has resulted in the instructor's regarding nothing as fixed or sacred. A teaching method is not good until proved so; course content is not valid until proved valid for a given group in terms of achievement and growth. This consideration of content and method as subject to challenge is not comforting to the instructor but results in great productiveness and more alert teaching. We have benefited from many research attacks upon the effectiveness of visual education, vocabulary background, lecture versus laboratory, prerequisites for given courses, student participation in course determination, and like problems. A study of voluntary reading in the Guided Reading Room and its relation to student ability, interest, reading speed, and vocabulary is cited as an interesting offshoot of our current curriculum research.[1] More concrete evidence of certain of these researches is found in a series of syllabuses and textbooks available in such courses as general arts, writing laboratory, physical sciences, choice of an occupation, economic geography, basic wealth, and contemporary affairs. The syllabuses are revised almost yearly. Two of them have developed into textbooks, with another now in press and three more being written in a series of general-education textbooks edited by Dean MacLean.

Two basic curriculum research projects are in process, one a study of adolescence or of students in the College, and another of young adults, former students of the University who have been out away from their college experience for several years. In one instance, we are trying to discover the interests, capacities, and backgrounds of our adolescent student population, and in the other, the problems, activities, and college reactions of former University students now facing adult-life adjustments.

THE writer spent the spring of 1937, by a grant-in-aid from the General Education Board, in studying various research projects in the field of

[1]Wrenn, C. Gilbert. "Reading Room Experiment in the General College," *California Journal of Secondary Education*, XII (November, 1937), pp. 398–401.

adolescence, those of the Progressive Education Association, the Harvard Psychological Clinic, the American Youth Commission, Sarah Lawrence College, and the University of California. He is quite aware, therefore, that the General College Study of Adolescence is unusual only in terms of the methods used and objectives sought. A study of thirteen hundred students in the College on 76 items of information was used as the background for securing a careful sampling of one hundred students for intensive case study. This large background group made it possible to select a group of one hundred for case study that is fully representative of the total College student body. One point of emphasis in the case studies was that of determining certain of the home pressures and influences that affect college behavior and achievement. Many of the same attitude items and questions of home life were answered separately by the student, by his father, and by his mother, in the expectation of discovering pressures upon the student through an analysis of differences in the responses of child and parent. A total of about twenty hours of interviewing and filling out of schedules was engaged in for each 100 cases. There are more than one hundred pages of detailed information regarding each student.

The study of young adults is somewhat unique in both scope and purpose. A careful random sampling of the freshman classes at the University of Minnesota for each of four years was made, 400 students being selected from each of the four classes. The sampling was made from the freshman or entering class so that an adequate representation would be had of those who stayed in the University for varying lengths of time. The freshman classes chosen were those of 1925–26, whose graduates would normally have entered the vocational world before the depression, and those of 1928–29, whose graduates would have faced job-getting during the depression. Space forbids entering into the details of this extensive study except to indicate that a 67-per cent return was secured from a 52-page illustrated questionnaire upon which our staff had spent over a year. Detailed information as to problems, activities, and interests was secured in the four areas of vocational life, home life, personal life, and social-civic life. This information was placed on Hollerith cards. In order to secure certain types of more intangible information in the areas of emotional problems, family attitudes, and philosophy of life, 200 cases were selected upon a sampling basis for interviewing. A nineteen-page interview schedule was constructed so that the interview results could be tabulated objectively as well as provide the basis of a case-study summary.

These two studies, that of adolescents and that of young adults, are basic to the development of the General College in curriculum, in personnel work, and in administration, although they are cited under curriculum research since they will doubtless be most influential at this point.[2]

Research upon the examinations

[2]The tabulations will be completed soon.

and the measurement of student achievement should again be thought of as a dual function. A primary research function of examinations is that they be used as a research tool, as a means to the end of curriculum evaluation. A secondary research objective in this area is quite obvious, however, and that is research upon the construction of good tools or good examination items and techniques. The first objective, that of curriculum and teaching evaluation, cannot be adequately approached until good tools are available. Considerable research at the General College, conducted through the University Committee on Educational Research, has been directed at the problem of providing better examination techniques. Some definite progress has been made in the direction of an understanding of the relationship between different types or levels of mastery—vocabulary, information, and principles, application of principles to new situations, and the like—or the type of items that measure best in given subject fields.[3]

These specific research results are not too impressive. What is more impressive are two more remote aspects, one of which is the fact that this examination research program has been highly educational for our teaching staff and has aided them in organizing their courses around specific objectives that are responsive to evaluation. Through this program there has been a constant use of available techniques in the evaluation of course content and method. One cannot stay idle in terms of evaluating curriculum change while better examination tools are being developed. Every major curriculum or course change has been checked by examinations to the extent made possible with existing instruments. One provision of a recent grant from the General Education Board was that of a full-time evaluator, working both with the General College curriculum and the visual-education research project. She will utilize available examination techniques and develop new ones as necessary in order to evaluate the changes in the curriculum as they are made during the next two years upon the basis of information secured from the adolescent and adult studies.

Another marked characteristic of this examination research is that it is being conducted under the normal conditions existing in a going institution that must continuously serve its students and use examinations for marking purposes. This is not "laboratory" but realistic research, in which small increments of research advance are made as a phase of a "service" examination. It is a healthy influence for educational research to be conducted with regard for contextual relationships.

STUDENT personnel research implies that student personnel work is a distinct and discrete college function. This is true only to a degree. The best concept of a "curriculum" is to define it as inclusive of all the educational experiences of a student, in classroom and out. Cer-

[3]Committee on Educational Research. *The Effective General College Curriculum as Revealed by Examinations.* Minneapolis, Minnesota: University of Minnesota Press, 1937. xvi+427 pp.

tainly the term *student personnel work* is inclusive of both specialized functions and techniques and of a point of view that affects classroom teaching and college administration.[4] Only artificial distinctions at best can be made between research that affects student personnel procedures as such and research that affects curriculum objectives and administrative procedures. The study of adolescents in the General College, resulting in information on student capacities, interests, goals, and problems, is student personnel research as well as basic curriculum research. Certain techniques of counseling and of gathering information regarding students were experimentally attacked in this study. In addition, our personnel research staff has made extensive studies of attitudes, of categories of problems revealed through counseling, of information most useful in educational and vocational planning.[5] Another group of studies that is significant for both the general administration of the College and its student personnel service, concerns the relation of the General College to other units of the University, such as a follow-up study of the effectiveness of the prediction of success of 500 transfers from the College to such other units, and a study of students who take courses in both the General College and other units. The Testing Bureau of the University conducts much research upon predictions, testing, and counseling that is of direct value to the student personnel work of the General College.

THE administrative policy and regulations of the College under discussion are quite dependent upon curriculum, evaluation, and student personnel research, and upon research in other units of the University. Curriculum research to a considerable degree determines the basic organization of the college; research upon examinations has a direct influence upon the marking system adopted and regulations regarding the reporting of marks; while personnel research affects student regulations and many administrative relationships with other colleges. The research work of the board of admissions has given the College a basis for determining admissions policy. The proved value of certain techniques used in the University Testing Bureau provides a basis for requiring certain examinations in the testing program of Freshman Week.

In addition to these valuable by-products of basic research in seemingly nonadministrative areas, the College attempts, whenever possible, to meet an administrative problem through research. Cases in point are a study of the incidence and nature of the canceling of courses and a study of class attendance versus non-attendance in order to make intelligent regulations regarding these matters.

It would be a miracle indeed if a college were developed entirely upon a research basis. The General Col-

[4] Wrenn, C. Gilbert. "Vocational Guidance and the College Curriculum," *Occupations*, XVI (October, 1937), pp. 36–40.

[5] Darley, J. G., and Darley, Kathleen McConnon. "The Keystone of Curricular Planning," JOURNAL OF HIGHER EDUCATION, VIII (January, 1937), pp. 18–26. *Also*, MacLean, M. S.; Williams, Cornelia T.; and Darley, J. G. "Personnel Work and Guidance in the General College, University of Minnesota," *Education*, LVII (June, 1937), pp. 588–94.

lege is not. It is full of research holes and responsive to much necessary administrative dogma. The principle remains, however, that this College recognizes that it must build upon research if it is to develop intelligently and be able to justify its existence. There are other colleges in this country working valiantly at self-development through one or more of these four areas of research—curriculum, evaluation, student personnel, and administration. Duffus has called certain of these frontier institutions "thunder on the left." It is from such pioneering research and administrative experiments that the college of the future will be built. These colleges are often not educationally "respectable," they must fight their way against much suspicion and distrust, their faculties must expect sneers from their more traditional colleagues, but they are the hope of the future. The simple reason for their assured influence in the future is that they are striving to provide a college based upon the human needs and activities of the present and future rather than clinging to the respectable "dead bones" of the past.

Define Our Twentieth-Century Synthesis!

By H. SHERWOOD WARWICK

A Search in the Duplications of Survey Courses

SURVEY courses apparently have come to stay. Histories of civilization, surveys of social science, of natural science, and of the humanities seem to be accepted parts of the curriculum in many of the most important American universities; moreover, while there still remain institutions which have so far refused to capitulate, or even to accredit them, it appears that these new courses gain extra footholds wherever curriculum change is carried through. The inevitability that seems to invest this process is all the more amazing in view of the fact that it can hardly be said—at least, I have certainly not gained the impression—that instructors of survey courses are by any means fully agreed on the content of such courses, on how to teach them most effectively, or on whether the new setup has been either more serviceable or more interesting to the student. Certainly what I say is true of the faculty of the University of Louisville, than which there is no faculty, I believe, so committed to the program of survey courses.

We can explain this paradox only if we understand that faculties are increasingly expressing their conviction that the day of extreme specialization in education is past; that the time has come to effect a synthesis of the immense and complicated store of contemporary knowledge; that a student ought to emerge from collegiate cloisters with at least a speaking acquaintanceship with all realms of knowledge, not simply with a small segment of one particular field.

This new viewpoint in education obviously began as a reaction against a curriculum which impressed certain bold spirits as hopelessly hard and fast, narrow, and stereotyped. In this estimate most educators now concur. Let it be said at once that this article proposes no return to that old curriculum. It was narrow; more important, it seemed calculated to divorce education completely from any of the situations or problems that could conceivably confront the person who is alive today. To be sure, great teachers could humanize this orthodoxy, and they did; but great teachers, by definition, are few and far between. Even had they grown on trees, however, it would still have been ridiculous not to bring the curriculum up to date.

In swinging the pendulum so pre-

cipitately to the opposite extreme, however, its proponents have placed the burden of proof squarely upon themselves. "Drink ye all of it," exhorts Holy Scripture in quite another connection; yet the advocates of a twentieth-century synthesis of knowledge have chosen to commit themselves to a literal interpretation of this text in an age which possesses a store of knowledge apparently so vast as to be indigestible. Of the dangers and difficulties inherent in such a scheme of things, some, I believe, already have been anticipated, while others require further discussion.

The primary danger, as I see it, arises from overlapping. A colleague of mine commenting on the problem, cited the specific example of Plato. The great Greek philosopher, he averred, would be discussed in a large number of courses philosophy, in which he would bulk large in his own right, ancient history, humanities, history of civilization, survey of the social sciences, history of political thought. According to the setup in our particular university, every student would be required to take at least two of these courses in which Plato would receive much emphasis—humanities, history of civilization; it might well be that a student would be forced to take one, or even two of the others in addition, and thus would hear Plato expounded over and over. If such duplication is possible in the case of a thinker of the remote past, how much more duplication is to be expected concerning a thinker of the modern era, when we consider how greatly curriculums are weighted in favor of current institutions and trends and their immediate roots! Are we wasting time? With so much to consider, can we justify the constant repetition of the achievements of the same intellectual giants in so many widely different fields?

OF COURSE it is possible to answer, as some of us did (and I recall that such was once my reply), that overlapping was all to the good. We had so much to cover, and perhaps there was not time to impress certain necessary data firmly upon the student's mind. If there was repetition in courses, it would probably enable him to understand better what we were talking about, particularly if these other subjects were taken concurrently. But we really did not think the thing through. We did not see that such optimistic indifference to the possibility of overlapping would logically force us all to agree on a certain fixed body of knowledge which was worthy of being taught over and over until it was fairly drilled into the student's mind. This is exactly what President Hutchins of the University of Chicago has recently advocated.

President Hutchins roused a tremendous storm of opposition to his scheme. Such opposition was quite natural, for we began our revolt against what we thought a narrow and antiquated curriculum, dominated by the departments of classical languages, and seemingly dedicated to the proposition that the student must have no knowledge of the world in which he would have to live. We determined that our curriculum

should be as broad as the old one was narrow. Our curriculum was to be practical, up-to-date, and above all socially conscious, which the old one was not. And now President Hutchins asks us to be narrow again!

Nor is that all. He suggests that our fixed body of knowledge shall be remarkably close to that of the scholastics of the High Middle Age, which would certainly make it the reverse of practical and up-to-date; socially conscious indeed it might be, but geared to the wrong age! We would be back where we started—nay, worse off, for we would be substituting medievalism for classicism, and the word *medieval* has the bad odor of barbarism and obscurantism indelibly affixed to it.

While we were pouring our vitriol on President Hutchins' neo-medieval curriculum we completely failed to note that this gentleman was actually a step or so ahead of us. For did we not desire a synthesis of all knowledge, a synthesis made the more desirable, and even urgent, by the vast bulk and complexity of that knowledge? Did we not vehemently repudiate the view that modern man is condemned to be an eternal specialist, locked tightly in his own little field, and indeed in a subdivision of that? Did we not cry, in high moral grandeur, that unless we could combat this attitude, there would be no hope for our modern civilization? Yes, we said that it was pure anarchy for a specialist to disclaim all knowledge of the problems of other specialists, for that meant that no man could understand or sympathize with his fellow men. Modern science and technology have wrought such a changed world that never before have individuals, and groups of individuals, and classes of individuals, and nations of individuals, been so mutually interdependent. This interdependence, especially in respect to the vital matters of men's jobs, and of their obligations as well as liberties under government, must be understood; not to co-operate is simply suicidal.

Obviously, no one can understand it all, or even the greater part of it, as the specialist understands his field. We were convinced, however, that there were "high spots"; that from each field we could carefully filter a vital minimum of fact and generalization. These select minima every one could, and must, learn. At least, we would see to it that every college student was required to expose himself, in this manner, to every field of knowledge. Once again educators, after a spell of disillusionment and even resignation, could enthusiastically revive their hopes of being able to mold and remake the world. But what, precisely, are these minima? President Hutchins undertakes to tell us what they are, and we receive a terrific jolt.

NOW it is apparent, I think, that if we are committed to a synthesis of knowledge, we are committed also to these minima of vital facts and generalizations as the only possible means of effecting such a synthesis. As an instructor in the history of civilization, I can hardly escape such a conclusion; I am given exactly one collegiate year to cover the whole

story of man's progress in all fields. As I interpret this assignment, I must grade and rank events and achievements as impartially as I do the examination papers of my students. I must pass lightly over certain data, however interesting or important they may be, if I believe them to be confined to one epoch alone. Other facts I must disregard altogether; I "fail" them, as I "fail" certain of my students, and for analogous reasons! No instructor in the other surveys, quantitatively, has such a comprehensive task as mine. Yet I suspect, after all, that his difficulties are as great as mine, when I reflect that it is usually easier for me to cover the forty-five hundred years from the Egyptian Pyramid Age to the dawn of modern times, than to present, in a more advanced course but in the same amount of time, the mere three hundred years of the Renaissance and the Reformation. We must inevitably face the fact that the survey demands an irreducible minimum of information, to the virtual exclusion of all data of mainly secondary importance.

Whole departments, in fact, must fall beneath the knife. Greek and Latin have collapsed in institution after institution, and nowhere enjoy a better than precarious existence, while even modern "living" languages are on the point of absorption into the field called "humanities," so rapid has been our progress toward a fixed body of knowledge.

Very well, if synthesis of knowledge equals an irreducible minimum of knowledge, we see that President Hutchins' suggestions spell evolution rather than treason. We must not forget that he has long been a leader in the development of the very curriculum to which we have committed ourselves. Why did he then pick the medieval synthesis? Because—and this should be obvious—because the scholastic system of the High Middle Age was, of all human attempts in the past to effect a synthesis of knowledge, by far the most successful. It even achieved, for most men of the thirteenth century, a measure of harmony between the realm of secular thought and that of faith and revelation. Aside from the High Middle Age, there have been but two epochs in the history of the human intellect which can even boast such a venture. Aristotle's synthesis of the fourth century B. C. was masterly and impressive; nevertheless, even he could not comprehend the whole of classical knowledge, and at any rate he lived too soon. The philosophers of the eighteenth-century Enlightenment attempted a synthesis based upon the progress of science, yet even as they wrote were outmoded and repudiated by the incessant development of science itself. Since we wish a synthesis, why should not Mr. Hutchins turn to the only successful one as his model?

I should make it clear here and now that I do not accept Mr. Hutchins' scheme, should it really be a return to medieval scholasticism; but I insist that his choice is logical and understandable. It should be welcomed as the first step toward tackling a problem which we have hitherto ignored. We must define our irreducible minimum of knowl-

edge before we shall be able to know where we are going, and when we discover how much overlapping there really is in our various survey courses, we shall know how inevitable it is that we come to some definite decision.

WE SHALL find, if we examine the matter, that this overlapping is far from an occasional presentation of the same data in different courses. The repetition is, on the contrary, frequent indeed. Nor is this strange. Our whole faculty, when they accepted the new program, agreed upon a similar viewpoint and a similar approach; with scarcely an exception they have gone wholeheartedly at the task of presenting that common integrating viewpoint, whether impelled by conviction of its merit, or simply because they considered that it ought to be given a fair trial. If our experience is a good sample of what has gone on in other institutions which have accepted the new curriculum—and I think it is—then never have professors gone so studiously to their books as in the past few years! Natural scientists have tried to learn overnight as much as they could of history, humanities, and social studies, and present such information to their classes along with scientific facts and hypotheses. I, for my part, who could scarcely pass collegiate courses in science and mathematics, have unblushingly expounded the Second Law of Thermodynamics and the Einstein Theory!

Why have I been so audacious? Well, because I had to be! Because we have all agreed that in our contemporary world scientific development, with its social implications, is the important thing. This suits the natural scientist well enough in his survey, although he is the least comfortable of all professors when he has to make broad generalizations and endeavor to link the minutiae of the laboratory with other fields. The sociologist, who is confident that his specialty is really a science, is likewise happy in his course, although it is perhaps a good thing that natural scientists do not have to hear some of the information which he presents as being the result of their researches! But in a third survey the professor of literature, or humanities, is hardly so happy; he has contracted to show how literature mirrors the contemporary scene, so dominated by science and technology. He feels obligated to spend much time trying to explain this scene and its distinctive nonliterary achievements, then emphasize the writers whose works show that they have been definitely influenced by this setup. Only then does he feel it fair to mention authors who write as though they were blissfully unconscious of the changed world about them. Usually, however, he has exhausted his time before he reaches this second group! Very well, it is their own fault for not conforming; maybe they are not so "significant" as had been thought! The instructor fervently hopes not, but all the same he feels a bit sheepish for passing them over in so cavalier a fashion. And the historian? In order to accomodate Einstein and others, plus many an author, artist, or musician, and finally to give plenty of emphasis

to Soviet Russia as the social experiment of the age, he dismisses with little more than a breath the remainder of postwar political history.

How can a vast bulk of material and interpretation in these four separate surveys fail to be the same? Nor is the case different when they are treating, for instance, the medieval epoch. Here the significant institutions are the feudal system and the Roman Catholic Church with its educational monopoly, and consequently all the surveys spend the bulk of their time expounding these institutions; the scientist here is most unhappy, and grasps desperately at the lone figure of Roger Bacon. The important point is that we certainly have, under our system, arrived willy-nilly at a body of fixed knowledge which we all present and emphasize.

Amazing, but true. And it was for this that we had to work so hard, and learn so much that was completely new to us! It all seemed so infinitely vast, this body of knowledge we set out to master. And now, in learning it, and in teaching it, we have made it contract! That, of course, was all to the good. Only there has been so alarmingly much shrinkage. What President Hutchins has done is open our eyes to this.

NOW I am not contending that all the surveys are presenting essentially the same material from beginning to end. I merely say that in each one there exists this fixed body of fact and generalization; it forms probably less than half the content of each survey course, but it is there. I think we must definitely accept this fact. Then I believe it would be valuable to draw tentative boundaries about this nucleus, in order that we may all really present it intelligently and intelligibly; later there will be time to expand these limits. Then let us examine and see what we actually have.

There is, to be sure, a danger in this. I am afraid that when we have defined our nucleus, some of its ardent proponents will want to teach nothing beyond it, and will want to merge all the surveys into one big nuclear course. Some of us have already given ominous warning that we plan to drop large portions of our own fields which no longer interest us, and simply annex, by way of compensation, other fields whose independence is frankly tottering. A decade ago, if I remember correctly, it was we historians—at least those who adhered to the "New History"—who declared that no realm was beyond our province, and that we would treat not simply the whole sphere of social studies, but the spheres of general culture and science as well; the old political-military-legal data were to be submerged. Since then, however, we have been brusquely put in our place by the economists, political scientists, and especially the sociologists, who tell us that history begins with the Industrial Revolution, and that they alone are competent to take care of what has happened since! We sought to gain the whole world, and have lost even the Old History! Of course we have refused to accept the dissolution of our field; though we have taken a rather bad beating from our brethren

in the modern and contemporary field, it still would seem that we were safe on the other side of 1800. But now the humanities have challenged us all along the line, and have set themselves up practically as historians! We have made them too socially conscious! Meanwhile, of course, they have effectively submerged the linguistic fields. So if we define our nucleus, and allow this process of "chiseling" to continue, we are likely to have nothing left but that nucleus.

WE MUST keep that from happening. It is well for our fixed body of knowledge to remain as a core within the different surveys, but it must not dominate the rest of the material to be presented. This certainly is what has frequently happened. The instructor in humanities, for instance, has often been so biased by this nucleus even in its yet undefined state, that he inevitably selects mainly those works of literature, or even art and music, which have clear social implications, neglecting a rich realm of creative talent of which the values are purely aesthetic or emotional. How far this tendency has progressed may be judged from the fact that substantially the same course which our faculty calls History of Civilization, is called Humanities at the University of Chicago. Unless this tendency is checked, rich fields will lie fallow and unexploited, while those which find present favor will lose their identity and fall together in a muddled heap. And what of the student who is to receive such a doubtful heritage? I fear that he will be almost as hopelessly confused as the faculty!

But I mean to offer no counsel of despair. We have our "peeves" against the survey courses, but I do not think we have lost faith in them. Certainly having to teach them has given most of us a liberal education such as we never got before in our academic careers, and there is no reason to think that, despite all our bungling, we have not passed some of that on to our students—and I do not mean the bungling! There is work to do, however. We should at once set out to define and limit this fixed body of knowledge that has emerged from our new curriculum. Certainly that will be more profitable and constructive than damning President Hutchins and his program. All this hue and cry seems very much to indicate that most of us have been thrown into abject panic by this "treason from within the ranks"; moreover, it sounds suspiciously as though most of us have no program at all, or that, claiming to have a program, we are blissfully ignorant of what it is. At any rate, why be "frighted by false fire"? If Mr. Hutchins really is suggesting that Aquinas's *Summa Theologica* be our standard textbook, or simply that our curriculum be modelled on that of the thirteenth-century universities, then I, too—medievalist as I am—fully share the general disapproval. Even so, why miss his main implication, that our surveys have headed us, and indeed already brought us, to the necessity of a synthesis, to the definition of an academic nucleus?

Will our synthesis turn out to be

medieval scholasticism, or something of the sort? How could it be? Even were we rigidly to accept the medieval framework, we simply could not handle the thirteenth-century content. Try to read St. Thomas Aquinas! We no longer speak his language! But, if only because we have had vague fears aroused in our minds, let us really define and know our nucleus. Let us see whether it has a thirteenth- or a twentieth-century aspect! Yet even if we discover some narrow, some seemingly medieval, points about it, we have in our power the means to sterilize those retrogressive features. We can, if need be, keep that nucleus small. We can encourage, and insist upon, wide specialization beyond it. Remember, the Scholastics, after all, simply merged two syntheses that were their spiritual and cultural inheritance; their foundations were Christian revealed truth and the vast system of Aristotle. Their intellectual bases were neatly compact, for they disregarded vast areas of ancient thought; our intellectual base is endless and diverse, comprising an area never dreamed of before in man's history. Our synthesis, unlike theirs, need be no narrower than we wish it to be.

Some Factors in General Education

By SCHILLER SCROGGS

Meaning through Historical Background and Interpretation

THE old unity of knowledge represented in the early college curriculum was vitiated by the rise of science in the nineteenth century. Progress in other fields also operated in that direction. Harvard chose to make room for the accumulations of new knowledge by the elective system. This plan spread until students faced a chaos of offerings without guidance other than their own interests—more assumed, perhaps, than real. Meanwhile, the university idea of specialization rose to prominence. This gave a narrow unity again to the individual curriculum that utilized the principle, but the only unifying factor for most students became the registrar's bookkeeping system. The sum of one hundred twenty hours, or whatever the requirement, became the cynosure of academic progress for the masses.

Because unrestricted election and the credit system led often to the extremes of overspecialization or of superficial scattering, unification through freshman requirements, group election, and course prerequisites was tried. Then came the plan of distribution and concentration. The Freshman "distributes" his courses through several departments and may elect no more than two in the same subject. In the sophomore year, the beginnings of specialization are made, but the junior and senior years constitute the period in which the student spends considerable time concentrating in one field.

This is the system which, with diverse modifications, prevails today. In the plan for distribution we find the beginnings of present-day concepts of general education at the college level, for the development of survey courses was a logical next step. The survey courses were principally departmental in scope and should not be identified with orientation courses, which sought to cut across related departments and present material designed to orient the student with respect to a particular field or profession, or even to life in general. The criticisms of most survey courses are that they adhere too strictly to the chronological approach, that there is too much learning about culture and too little experience with it, that the encyclopedic approach dominates the selection of subject-matter, and emphasis is upon memorization rather than problem solving.

Sharp distinction should be made between the general course and the survey course. The survey course aims at presenting a bird's-eye view of a large field of integrated knowledge and preserves so far as possible the customary systematic organization within the field. This results too often in the presentation of topics with insufficient development. The general course, on the other hand, should attempt a resynthesis of knowledge around those general concepts that run through the entire field, with the presentation of sufficient detail to give these general concepts meaning. If we wish to bring clarity and precision to our terms, we should not classify as general courses those whose object is to give particulars instead of generalities; for example, a non-technical course in house-planning. That is, the term should be reserved for courses organized about generalities, rather than courses presenting general information.

WHILE the professors were grappling with the problem of bringing unity and generality back to the curriculum, college administrators were laboring with the task of remodeling college organization so that it would better fit the changed curriculum and clientèle. In the universities this took the form of a partition of the college into upper and lower divisions. Outside the universities, at least two new units have evolved, the most spectacular of which from the point of its widespread appearance and acceptance is the junior college. L. V. Koos states that the clarification of purposes appropriate to the curriculum of colleges and universities

is bringing increased emphasis on exploration and orientation, broad general education, and the intimate articulation of high school and junior college years; it is stimulating the emergence of purposes like the rounding out of general education during these years, the horizontal unification of education, and provision for students not going on to levels beyond the junior college period; and it is recommending for subordinate rôles the traditional purposes of preparation for advanced work, the beginning of specialization, and selection for higher levels with which the first two groups of purposes just named are in at least partial conflict.[1]

A further development of these trends is illustrated by the General College in the University of Minnesota. It is a two- or three-year plan seeking, in the words of its director, Malcolm S. MacLean, "to bring into the concrete a new definition of general education." It not only is relatively unintegrated with the established units of the University, it is to some extent a revolt against them. Its clientèle is largely young people not admissible to or failing in the older colleges, or not interested in entering them. It is an extreme product of the forces that have been modifying the courses in traditional colleges for a generation.

A third factor in the evolution of general education is psychology. To an age that had lost first its soul, then its mind, and finally consciousness, an adequate theory of personality proved baffling. It is not

[1] "Significant Trends in the Junior College," *General Education*, p. 105.

surprising that the next step has been an attempt to approach the individual as a unit. In *Gestalt* or pattern psychology we have what someone has styled "organismic" psychology, because it conceives of parts in relation to each other through their relations to the whole organism. One of their basic postulates is that "the whole is greater than the sum of its parts," meaning that organization results in a new synthesis which is not merely an aggregation of component parts, but a new functional unity with new powers, capacities, characteristics not found in or caused by any one of its parts in isolation.

With the progress of psychology from introspection through a study of the physiological bases of mental phenomena and the observation of behavior, to the notion of organismic development and differentiation, our educational concepts have shifted from the purely intellectual stress, through an appreciation of individual differences, and of physiological, sociological, and psychological unity, to a more acute awareness of the individual as a part of society, and the obligation of the school to orient him in society, and teach him in time to adjust society to his needs.

TWO implications of educational emphasis upon the individual are adjustment and integration. The student should be adjusted through his educational experiences—whether in the school, the church, the home, or in any other educational institution—to broad areas of living. It is noticeable at once that such a principle introduces a difference between general education that deals with the functions of the individual in society and that which focuses upon subject-matter survey. The areas of interest are multiplied and broadened. The school becomes definitely concerned with giving the student those experiences which will bring him into proper attitude toward and relationship with other individuals, with the social institutions which condition his life and to which he in turn—in a democratic society—should endeavor to give form and direction; and with the universe, including a scheme of values and an attitude toward God and religion that is something more than a puny agnosticism on the one hand or a self-arrogating escape mechanism on the other. The school must have concern about the health of the individual, both mental and physical, and consequently the physician, the nurse, and the psychiatrist are making their appearance. Even in subject-matter instruction the student needs consistent and periodic advice concerning methods of study; and above all he needs to realize that subject-matter is a means to an end, a very complex end, indeed, in which such powers of thought as analysis, synthesis, comparison, contrast, research, organization, and expression are more important than the mere retention of abstractions or the perfection of manual skills. The student also needs vocational orientation and training, although the latter does not fall within the concept of general education as here developed. As a part of general education, however, the student may survey vocational possibilities, take courses designed to

broaden his understanding and appreciation of a wide range of possible vocations and to help find one best suited for himself. Here vocational counseling is urgently needed, as well as a testing clinic which can help the student to discover his aptitudes and interests. Our social order is too complex for a youth unaided to chart his own educational course, even vocationally, and even if he should make the right choices he needs verification of them and guidance.

TURNING to integration, we may note such aspects as educational integration, which looks toward the broad comprehension of the interconnections within and significances of wide areas of knowledge; the integration of personality, which is directed toward the acquisition by the individual of such interconnections of traits of character that conduct will be the expression of a unified, rationalized self; the integration of environment, which is the arrangement of the dominant aspects of the general situation to which the student reacts and in reacting builds his character so that there will be induced a minimum of mental conflict; of philosophy, which in itself is a comprehensive rationalization of the meaning of experience resulting in the formulation of a scheme of values; and of education as a way of life that will be in the long run most satisfying in terms of that scheme of values.

The principle of integration in education is simply a recognition of the fact that individuals respond as integrated-energy systems to the total situation as they sense it, rather than with one of several faculties or sets of neural connections to a dominant element in the situation. This gives rise to a patterned response, including reactions to many concomitant elements, but with all reactions associated, or integrated into the pattern. The problem of the professor is to make these concomitant elements allies instead of competitors.

It is obvious that such aspects of individual development as adjustment and integration call for a decided redefinition of liberal education. Liberal education in the traditional sense is intimately bound up with specialized subject-matter, not because subject-matter was at first the essence of liberal education, but because subject-matter was thought to be consonant with knowledge. Knowledge, however, must have a directly experimental basis. Even the subjective idealists and the rationalists believed that. There is nothing modernistic about the fact at all. Education, therefore, becomes the progressive reconstruction of experience; the ever widening comprehension of relationships of self with the universe through encountering new situations, new phenomena, new stimuli in ever novel combinations, arrangements, and patterns; and the linkage of these with significant interpretations or meanings.

The doctrine of interest has been well established in educational thought. There are many of us—a strong majority, we hope—who still have confidence in the mature to guide the young and to know, at least more wisely than they, what is good for them, but it would appear psycho-

logically sound to insist that the materials and methods of education be adapted to the interests and comprehension (for lack of interest is often due to lack of comprehension) of young people, and in terms more or less of their experience. The dilemma of interest comes when all reasonable adaptations have been made and still the student does not respond.

THE implication of these remarks is that education begins with the student, not with subject-matter. The teacher is confronted with lively organisms that are to assimilate and integrate knowledge. The process is to be one of growth, not mechanics. It is not implied that subject-matter has only a menial place in education. That would be ridiculous. The only reason for formal education is to transmit somewhat vicariously the systematized knowledge which the race has accumulated. Especially where the student has announced his intention to qualify for a profession or technical calling requiring specific masteries is subject-matter important in itself. In general education, however, we use subject-matter not so much as an end in itself but as an integrative and adjusting agent, as a means whereby the student can become aware of his thought processes and master the procedures or patterns of mental action. This may not be the responsibility of the advanced subject-matter professor; but if the college does not teach how to think, who will? Every subject is in a peculiar way a system of logic. How, then, can thinking be taught apart from subject-matter? We must, if we are sincere about giving a liberal education, use every available facility to help the student become a free soul in the world as it is, without resort to escape mechanisms or withdrawal from active life. This means that he must be able to deal with material as well as know it.

Much of our trouble rises out of the impact of social change upon higher education, and the difficulty with which colleges and universities adjust to it. We are all aware of the tremendous growth in college enrollment. We know that while the spurt came during and after the war, the movement had been on well since the turn of the century. What we have not always grasped is that the increasing length of dependency in this country has been correlative to the mechanization of industry. First, the elementary school took up the slack, then the secondary school, and now the surplus is being sent to college.

We may regard this surplus of youth as we may wish, as bane or opportunity, but at least we should face the problem of its existence realistically. This means that we should be willing to suggest an alternative for college that will be feasible and sensible. The two outstanding requirements of the alternative are that it must provide an environment that will actively challenge youth to be socially as well as academically intelligent in attitude and in action, and that it must look toward and in a measure provide for the vocational placement of youth. The alternatives which confront the small college are—except for their function as colleges for the eco-

nomically sufficient—the ceding of the first two years of college to the public high school, or the provision of a new general education that will meet the demands of our social crisis. For the large college and the university there is the alternative of dropping the first two years of college, integrating the first year of graduate work with the upper division, beginning specialization in the junior year.

The public high school, however, is not in position, except in the larger centers of population, to deal with the problem adequately. Certainly elimination in and of itself furnishes no sufficient nor even acceptable solution. There are some students in college who are failing simply because the demands made upon their time by earning a living or the inadequacy of their diet and rooming facilities prevent them from doing well. To be content with their elimination from the college opportunities is narrow, undemocratic, and unfeeling. No brief is here held for the indifferent, the lazy, the inadequate; but too often it is a case of "the sheep look up but are not fed," with a quite different slant from that employed by Chicago's Hutchins in his recent compilation of addresses. Surely the college will not force the creation of a competing institution by denying responsibility for the social and intellectual orientation of the average student.

The problems of motivating the nonscholar, of building for him a student-centered instead of a content-centered curriculum, of accepting his needs as criteria of subject-matter selection, of insuring his comprehension of objectives and ends in the educative process, of viewing education as a process rather than a goal, as the multiplication of neural connections rather than the mastery of systems of knowledge, of so introducing the student to a selected series of experiences and aiding and stimulating him to think about them meaningfully that he will slowly but surely evolve a scheme of values that will bring a sense of validity into his life—these problems are among the most urgent of general education.

The difficulty is not simply one of re-working old systems into a palatable form for inferior individuals who have been admitted into the sacred cloisters. It is one of finding new bases of synthesis for wide areas of knowledge that have long ago expanded beyond the possibility of their systematic mastery even by encyclopedic minds. It is one of finding new bases for synthesis which will recognize not only the changed organization and clientèle of the college, but the new *rapprochement* between school and society which characterizes the coming order; which will take into account the recent developments in psychology. Both of these latter factors argue for a psychological rather than a logical approach to learning.

In the minds of those who have watched the amazing expansion and differentiation of colleges and universities in the United States since 1890, who have witnessed the revolutionary changes in their clientèle, structure, objectives, there exists little doubt as to the likelihood of further adjustments, upon which attention is directed today.

A Use of Index Numbers

By PAUL S. DWYER

To Determine a Summary Figure for the Measurable Aspects of Teaching-Load

EVERY administrator is familiar with the fact that it is impossible to obtain measures of the teaching-load which are completely satisfactory. Since the duties of faculty members are diverse and the activities in which they engage have such different relationships to the university, it is impossible to classify all the different elements and to measure them quantitatively. There are certain aspects of the teaching-load, however, which are definitely measurable and subject to statistical treatment. The number of courses an instructor teaches, the number of hours he spends in the classroom, the number of students enrolled in his classes, and other like items, are, if certain comparable standards are set up, definitely measurable. These different measures are not, however, necessarily consistent, nor even highly correlated; nor is a measure in one department always comparable to a corresponding measure in another department. Devices are needed by which the different measures may be combined into a composite measure, and by which relative or comparable values may be obtained. It is here suggested that index numbers may be used to accomplish these ends.

In the present discussion we limit ourselves to the case of the "measurable teaching-load," that is, to those aspects of the teaching-load which are definitely measurable. A corresponding approach could be applied, with somewhat less reliability, to those aspects of the teaching-load which may be estimated, if not measured; for example, such items as estimates of the amount of time spent in research, administration, and the like.

Various ways of appraising the measurable teaching-load have been in use. Probably the earliest and simplest was the number of courses taught. This measure was obviously inadequate in that the number of teaching hours varied with the different courses and so was soon supplanted by the semester-hour unit. An instructor's load in semester-hours is simply the number of hours per week the instructor devotes to lecture, recitation, or laboratory. As Vice-President Yoakum has pointed out, the semester-hour was introduced naturally, as it is a measure which corresponds to that with which the student load is measured.[1]

[1]Yoakum, C. S. *Functions of the Faculty: the Work Load.* Ann Arbor, Michigan: University of Michigan Press, 1932. p. 24. (University of Michigan Administrative Studies, Volume I, No. 2)

The method of measuring by semester-hours, which was inadequate in that it did not take into account the number of students in the class, was in turn supplanted by the credit-hour. The load of the instructor was measured by the number of credits amassed under his tutelage. The credit-hour unit did some injustice to instructors of laboratory courses and to instructors of other courses where the actual number of instructional hours was larger than the number of credits given. It gave way in turn to the student clock-hour. Each student who is under the supervision of a given instructor for a college hour each week generates a student clock-hour for that instructor. The measurable teaching-load of the instructor is then indicated by the total number of student clock-hours generated by students under his instruction. The student clock-hour is perhaps the fairest single measure of teaching-load yet used, and yet it is possible for lecturers with large classes to generate large numbers of student clock-hours quite easily.

NONE of the conventional measures is inclusive enough to include all aspects of the measurable teaching-load. An adequate survey would demand, it would seem, a listing of the chief important items which are measurable. Such items include the three given earlier, subdivisions of some of them, and additional ones. At the University of Michigan such measurable items as the following have been regularly recorded for each semester: the number of courses, credit-hours, hours of lecture, recitation, and laboratory for each instructor; the total number of teaching hours and teaching hours spent with graduate students; the number of first-year, second-year, third-year, fourth-year students, special, and graduate students in each class; the number of students from other units of the University in each class; the number of students for each instructor; and number of student clock-hours for each instructor. Summaries of these measures by departments have been regularly computed for each semester.

The standards set up to measure these different items have been, as a matter of necessity, somewhat arbitrary. For example, the records are taken, not at the beginning of the semester when the enrollment is larger, nor at the end of the semester when the enrollment is somewhat smaller than throughout the term, but about the third week of the semester when the programs of both faculty and students are quite definitely fixed. It does not seem wise to go into detail here with reference to all these standards, but corresponding measures have been adhered to so that, in the main, the measures for different semesters are comparable.

It should be noted that it is possible, with further differentiation, to break up the measurable teaching-load into a larger number of items. Too much differentiation, however, is apt to result in estimates rather than measures. The items just listed, with the possible exception of the number of teaching hours spent with graduate students, can be measured in most of the units of the University quite

objectively. An attempt has been made to include all the chief measurable aspects of the teaching-load, explicitly or implicitly, in this list.

It is desirable to establish norms for each of the measures used. This can be done by taking an average, over several semesters, of the departmental averages. In looking over our records at the University of Michigan, we found that we had comparable information for the seven semester periods beginning with the second semester of 1932–33 and terminating with the second semester of 1935–36.[2] We then punched on Hollerith cards the summary for each department for each of the seven semesters and established norms from the resulting runs. In this study, all teachers, whether full- or part-time, were represented. In the case of part-time teachers, a decimal equivalent of the amount of time spent in teaching was computed so that averages were computed on the basis of the equivalent full-time teachers.

The relative variation for the different semesters can be shown by the use of index numbers. We use the average of the seven semesters as a base and find the percentage equivalents of the individual semester entries. Thus the index number associated with the number of courses for the second semester of 1932–33 is

$$\frac{3.34}{3.39} \times 100 = 99.$$

The whole set of corresponding index numbers is given in Table I.

The relative variation of the different components is now observable.

TABLE I

INDEX NUMBERS SHOWING THE RELATIVE VARIATION FOR THE DIFFERENT MEASURABLE COMPONENTS OF THE TEACHING-LOAD DURING THE SEVEN SEMESTERS

MEASURABLE ITEMS	1933	1934		1935		1936		AVERAGE
	2	1	2	1	2	1	2	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Courses	99	97	104	96	104	99	102	100
Credit-hours	98	98	102	98	103	100	102	100
Teaching hours—								
Lecture	102	100	105	95	104	96	99	100
Recitation	94	100	95	103	101	107	101	100
Laboratory	99	96	100	101	103	100	101	100
Graduate	130	102	111	91	94	88	85	100
Total teaching hours	102	99	100	99	101	100	98	100
Enrollment—								
First-year	67	105	95	110	108	117	99	100
Second-year	73	100	84	123	98	124	99	100
Third-year	90	94	106	95	107	94	113	100
Fourth-year	101	105	91	109	98	99	96	100
Special	123	100	90	93	100	97	103	101
Graduate	108	108	98	90	93	104	100	100
From other departments	67	99	86	109	96	127	115	100
Total	81	101	93	108	101	112	104	100
Student clock-hours	83	100	94	108	102	112	102	100

[2] Departmental summaries for the years 1936–37 and 1937–38 were not complete at the time.

For example, one can see that the enrollment figures are, in general, larger for the first semester than for the second semester. One can tell, too, the extent to which the first-semester figures are larger than the second-semester figures.

We desire also a single summary figure which represents the total measurable teaching-load for a given semester. Such a measure may be obtained by taking an average of the sixteen different components recorded.

TABLE II

THE AVERAGE OF DIFFERENT NUMBERS OF COMPONENTS OF TEACHING-LOAD FOR EACH SEMESTER

SEMESTERS	AVERAGE OF INDEX NUMBERS		
	Sixteen Components	Five Components	Three Components
(1)	(2)	(3)	(4)
1932–33—Second.	95	93	94
1933–34—First...	100	99	99
Second.	97	99	98
1934–35—First...	102	102	102
Second.	101	102	102
1935–36—First...	105	105	104
Second.	101	102	101

These measures for the seven semesters considered here are given in Column 2 of Table II. The summary numbers indicate a variation from 95 to 105 in the average measurable teaching-load for the seven semesters. There is also indicated a tendency for the heavier load to appear in the first semester.

One may argue against giving each of the 16 components equal weight. Thus it is obvious that the component giving the number of special students should not be given weight equal to the component showing number of graduate students. Besides, in the form given, duplications have been made in counting totals as well as the more differentiated items. However, the elimination of the figures for total teaching hours and for total enrollment do not change the summary figures to any great extent. In fact, these summary figures are not greatly changed if the sixteen components are replaced by the five basic ones: number of courses, number of credit-hours, number of teaching hours, total enrollment, and student clock-hours. Averaging these five components we get the averages given in Column 3 of Table II. This set of summary figures is probably a more useful set than the first set given since it does not give too much weight to the enrollment figures and teaching-hour figures. Also it is easier to compute, as one needs to measure only five components, not sixteen.

It should be stated here that the information contained in the sixteen components would permit a much more differentiated and detailed means of measurement if we had accessible the proper weights to apply to the different components. The determination of these weights is definitely possible, under certain assumptions, but it seems wise to adjust ourselves to the simpler and less differentiated scheme rather than to go into too much detail.

STUDY reveals that the five components can be replaced by three without appreciable loss since the figure for student clock-hours is highly correlated with the enrollment figure, and the number of courses with the

number of credit-hours. We find if we take an average of the three index numbers of the components—number of different credit-hours, number of teaching hours, and total enrollment—that we have practically the same summary figures already given (*see* Column 4 of Table II). To check this statement the reader will compare the figures in the third and fourth columns of Table II.

The three components used are sensible components of the teaching-load. The first, number of different credit-hours taught, gives an indication of the amount of preparation time the instructor has to spend. The second, the actual teaching-load, gives an indication of the actual amount of time the instructor spends in the classroom; the third, the total enrollment, gives an indication of the amount of time spent in conferences, marking papers, and the like. It is here recommended that, as the next step in obtaining a more satisfactory measure of the measurable teaching-load, these three independent and easily determined components be used. It is possible that these components should not be assigned equal weight in forming a composite figure for the measurable teaching-load, but until some less arbitrary weighting system is worked out, it appears wise to give them equal weight.

It should be said finally that such methods have been applied not only to the variation of the teaching-load for different semesters, but to a variety of other problems. They have been applied at the University of Michigan to such problems as finding the relative teaching-loads of the different professorial ranks of a college, finding the relative teaching-loads of the different professorial ranks of a department, finding the relative measurable teaching-load of individual faculty members as compared with others in the same department having the same academic rank, and the like. The technique is recommended for those who wish to obtain a better summary measure of the measurable teaching-load than is possible with the use of the conventional student clock-hour method.

· *With the* · Technicians ·

Languages and Technology

The December issue of *The Technology Review* contains the report of the Visiting Committee on the Department of Foreign Languages to the Corporation of Massachusetts Institute of Technology. The members of the Committee were three alumni, James M. Barker, '07, H. Daland Chandler, '08, and Arthur T. Hopkins, '97, with John E. Aldred, Christian Gauss, and Robert E. Rockwood. The report begins with a statement of the value of modern-language instruction in a technical school. Since the aim of the Institute "is not merely to graduate skilled technicians," but rather to educate men who are "thoroughly grounded in the technical aspects of an engineering or scientific profession, who shall also have some correlated knowledge of the general work and life of the world," the humanities, with modern languages among them, have a place in the curriculum of the Institute.

The Committee sought for fundamental principles which should guide the inclusion or exclusion of modern languages from the course of study. They found that modern languages, particularly French and German, are of some importance in certain courses as tools for increased scientific accomplishment. This principle logically led them to the statement that the need of the students was for a technical vocabulary. The second principle, that modern languages are a desirable part of a liberal education, seemed of less importance to the Committee.

The conclusion of their deliberations which were presented to the Corporation were:

First, the aim of each modern-language course given at the Institute should be clearly defined. Second, the ability to read foreign technical literature should be required in the courses where those in charge ascribe importance to such ability. Third, the Institute should provide carefully planned elementary modern-language instruction for students who are specializing in fields which require it and who have not had preparatory-school elementary language training. Eventually it may be possible to eliminate such instruction by substituting corresponding entrance language requirements. Fourth, the responsibility for acquiring a technical reading vocabulary should be placed on the individual student and not on any Institute modern-language instruction. Fifth, knowledge of at least one modern language can be an important element in the liberal education of our graduates. For this reason the Institute should continue to provide broad modern language instruction for such students as elect to take it among their humanities. Sixth, such language courses should be carefully planned to have intrinsic interest and not be allowed to disintegrate into the conventional, dull drudgery of grammar rules, oral translation of the foreign language, and written translation from English into the foreign language. Seventh, the basic emphasis of these

courses should be on the language as a medium for the communication of ideas, and interest should be stimulated by such means as phonograph records, foreign films, and extra-curricular conversation clubs. Eighth, the constant attempt of the Department should be to discover new ways of vitalizing modern language instruction, even at the expense of the conventional and traditional methods which have been used generally for so many years.

The Committee recognizes that reforms along this line will not be immediately possible of complete accomplishment but believes, however, that this is the direction in which we should move as an institution.

Student Mortality

One of the co-operative projects in research conducted by the United States Office of Education, *College Student Mortality*,[1] analyzes some of the factors involved in students' leaving college before graduation. In the 25 colleges which co-operated the records of 15,535 students were considered.

Age at entrance was found to have some bearing. Of the students entering when less than seventeen years of age, 47 per cent left the universities as compared with 72 per cent of those who entered when they were twenty years or older—"the percentages of students leaving the universities advanced concomitantly with each advance in age." Distance of homes of the students from the institution appeared to be related to mortality. In 21 of the 25 universities which co-operated, higher percentages of students with homes in another state left the institutions than those with homes within the county in which the institution is located.

Place of lodging also seemed to have some influence on mortality. Approximately three-fourths of the universities had a higher mortality among the students lodging at a rooming house or college dormitory than among those living at home with parents or at a fraternity or sorority house.

Larger percentages of the students who did not participate in extra-curricular activities left the universities than of those who did engage in such activities. Larger percentages of the students who did not engage in part-time work left the universities than those who engaged in part-time work, but the data seemed to indicate that this was not in any great degree an influencing factor in their withdrawal from the universities.

A causal relationship existed between deficiency in academic achievement and student mortality. Of the students leaving the group of universities as a whole, 14.2 per cent more earned fewer credit-hours than registered for in the semester than earned the same credit-hours registered for. There were 11.7 per cent of the students, or one of every nine, who earned no credit-hours in the semester when they left the universities. Larger percentages of the students making low academic marks left the universities than of those making high academic marks as shown by the ranking of their accumulated grade-point indexes into decile

[1] This study was commented on editorially in the October, 1938, issue of the JOURNAL.

groups. Of students whose indexes ranked them in the lowest tenth, 99.5 per cent left the universities as compared with 26.2 per cent whose indexes ranked them in the highest tenth. Moreover, the percentages of students leaving the universities increased proportionately with each step down in decile ranking of their academic marks.

Federally Aided

Vocational Education[2] by John Dale Russell and others, one of the series of 19 staff studies being published by the Advisory Committee on Education, surveys the plan of organization for the federally reimbursed program of vocational education, the outcomes of this service, the needs of the country for occupational preparation, and the manner in which those needs may be best met.

The report criticizes the Smith-Hughes Act (1917) and the George-Deen Act (1936), under which Federal aid for vocational education is now provided, as hampering proper development of training for jobs in the schools of the country by discouraging local initiative and experiment. The number of students in federally aided vocational-education classes increased from 164,183 in 1918 to 1,344,644 in 1937 (*see* Table XV), and the number of students in full-time day classes increased in the same period from 42,485 to 591,131 (*see* Table XVI). Nevertheless, the report states that the number of students reached is much smaller than the number that should be receiving vocational education (*see* pp. 116–17).

The Federal appropriations for vocational education are available only for instruction of pupils fourteen years of age or older, and for the preparation of teachers of such pupils. The total Federal expenditure for vocational education in 1937 was $10,013,669 (*see* Table V), but despite the need for an extended program Mr. Russell recommends that appropriations

should not be increased until there has been a relatively generous provision of funds for general education. The greatest advances in vocational education in the long run will come through relatively large Federal grants for general, unrestricted educational purposes rather than through grants specifically limited to vocational subjects. Designation of grants for vocational education could well be discontinued as soon as there is an adequate Federal appropriation for general, unspecified educational purposes. If designation of funds for vocational education is continued, the legislation should define this type of service broadly. Guidance and co-operative placement services should be included, and instruction at the junior college and adult levels should be particularly encouraged.

Test Scores and Subject Marks

An investigation to determine the relationship between scores on the verbal and mathematical sections of the Scholastic Aptitude Test, given by the College Entrance Examination Board to all applicants for admission to college, and marks in specific courses in first-year chemistry, first-

[2]Washington, D. C.: Government Printing Office, 1938. x+325 pp.

year mathematics, and elementary physics at the University of Pennsylvania, is reported by Morris Richard Dickter in his doctoral dissertation, *The Relationship between Scores on the Scholastic Aptitude Test and Marks in Mathematics and Science.*[3] The study covered the period from 1930 to 1936, the years during which both sections of the Scholastic Aptitude Test were taken by all applicants.

The data were gathered from the records of the students admitted to the University of Pennsylvania between 1930–31 and 1935–36, inclusive. A total of 9,251 marks was obtained, involving 2,466 students. These students were distributed throughout all the undergraduate schools of the University.

The relationship between test scores and course marks was calculated by means of the Pearson product-moment coefficients of correlation between the variables involved. Separate coefficients of correlation were computed between scores on the verbal section of the Scholastic Aptitude Test and marks in each of the courses for the students admitted to the University in each of the six years covered by this study. A similar procedure was followed for the correlations between scores on the mathematical section and the same courses in each of the years. To serve as a summary, coefficients of correlation were calculated, in addition, for each of the two sections and the various courses for the entire six-year period, regardless of the year of admission. A total of 158 correlations was made.

The correlations on the mathematical section were higher than those on the verbal section for every course, when considering results over the entire six-year period. The same trend was apparent in the correlations for each of the years. The correlations on the mathematical section were all above 0.4, with the exceptions of Chemistry 3 (Qualitative Analysis), Mathematics 7B (Elementary Analysis, continued), and Physics 18 (Electricity and Magnetism). The mathematical section was strongest in the case of Mathematics 5 (College Algebra), being close to 0.6, and weakest in the case of Chemistry 3, being just above 0.3. The relationship between the verbal section and achievement in chemistry and mathematics was low, the coefficients being in the neighborhood of 0.1 or 0.2.

The verbal section made its best showing, in comparison to the mathematical section, in the physics courses, the coefficients ranging between 0.3 and 0.4. The author suggests that one explanation of this fact may be that success in physics involves not only mathematical ability, but also ability to read and understand abstract material, a type of thinking that the verbal section measures. "It seems advisable, therefore, in the case of physics, to use the verbal section in conjunction with a mathematical section," Mr. Dickter states.

An analysis of the means of the scores on the verbal and mathematical sections for the various courses substantiates the evidence demonstrated by the coefficients of correlation, that the mathematical section is a more sensitive instrument than the verbal

[3] Philadelphia: University of Pennsylvania, 1937.

section in detecting groups of varying mathematical ability.

The fact that the correlations for the mathematical section are almost all above 0.4 indicates a considerable positive relation between the scores made by students on the mathematical section of the Scholastic Aptitude Test at the time of entering the University and their future academic success in the fields of chemistry, mathematics, and physics.

Engineers' Salaries

An illuminating cross section of comparative salaries of graduate engineers is provided by John D. Beatty in *Thirty Years of Personnel and Placement Work at the Carnegie Institute of Technology*. Surveys of the salaries of 1,449 graduates in 1930 and 1,163 graduates in 1937 show a significant drop in median salaries, the more significant because the graduates of 1929–30, the prior years, will also be found with seven years more experience in the 1937 lists. The table, which is worth quoting, is given here as Table I. In it a survey of 1,163 Carnegie engineering graduates made in April, 1937, furnished the information on salary standards. The median earnings of the April, 1937, survey are compared with the median earnings reported in the survey of 1,449 Carnegie engineering graduates during 1929–30.

TABLE I

SURVEY OF THE SALARIES OF THE ENGINEERING GRADUATES OF CARNEGIE TECH.

Year since Graduation	1929-30 Median Salary	1937 Median Salary
(1)	(2)	(3)
1	$1,902	$1,678
2	2,328	1,854
3	2,586	1,880
4	2,894	2,070
5	3,054	2,146
6	3,350	2,223
7	3,591	2,575
8	3,909	2,888
9	3,958	2,910
10	4,365	3,193
11	4,292	3,720
12	4,083	3,236
13	5,367	3,700
14	4,775	3,850
15	5,000	4,222
16	5,600	4,393
17	5,125	4,313
18	4,688	3,525
19	5,167	3,800
20	6,500	5,625
21	4,813	5,600
22	5,625	5,333
23	.....	5,250
24	.....	3,920
25	.....	3,900
26	.....	4,250
27	.....	5,750

·The·Reporter·

THE experimental education school for beginning teachers established at Columbia University in 1931, New College, is to be discontinued as a separate enterprise after June 30. Failure to secure adequate financial support was cited by the administration as the principal reason for abandoning the school.

A REPORT issued recently by Frank H. Bowles, director of admissions, Columbia University, reveals that applications for study in the professional schools of the University have increased 14 per cent in a year's time. The growing pressure for vocational education is also indicated by the fact that during the same period registration in nonprofessional courses decreased 4 per cent.

A STUDY of the administrative and curricular operations of ten colleges similar in size, character, and standards to Hamilton College will be made during the second semester by a member of the Hamilton College faculty. The research study will be made with the objective of comparing these operations with those now existing at Hamilton, and is part of the program of developing and extending the administrative and curricular undertakings of the College.

A SPECIAL committee of Cornell University's board of trustees has begun an active campaign to obtain funds for the $6,000,000 program to strengthen the resources of the College of Engineering. The immediate objectives, as outlined by President Day, include an increase in endowment of $2,500,000 for named professorships and general increasing of faculty salaries, and a fund of $3,500,000 for new buildings for the School of Chemical Engineering. In presenting the plan to meet immediate needs, President Day discussed a long-time project for the college, contemplating the replacement of all present buildings except one.

A NEW dictionary for educators, dealing with the more technical terms in all fields of education, is now in preparation and is expected to be completed in about four years. It will parallel the standard dictionaries of other professions. Henry D. Rinsland, one of the five men who are assembling the dictionary, has just compiled eighteen thousand terms in tests made in the field of educational measurements for material to be used in the proposed volume.

LISTENERS throughout the world are being told of the progress and development of higher education in this country by means of a new series of radio programs broadcast by Russell Sage College. The first of the series told the history of Russell Sage College and the story of higher education for women in this country. The

programs will continue once a month through May. The broadcasts are under the direction of the speech department of the college, and the casts are drawn from the advanced students in speech.

STAFF members of the English department at Bucknell University may now hear themselves as their students hear them. Recordings of portions of their lectures have been made, and instruction is being given where needed in the more efficient use of the voice. The service may be extended to other university departments, pending the outcome of the experiment with the English staff.

ADMINISTRATIVE methods at Russell Sage College have been changed recently to give the faculty a decisive voice in the formulation of educational policies. A faculty council will be set up with a chairman elected from the membership of the instructional staff. This council will study important administrative problems, report them to the faculty of the various schools and divisions, and then present them to a meeting of the faculty as a whole for discussion and action. Membership on the faculty council will be about equally divided between the social and practical sciences, the members to be elected by ballot among the faculties of the various schools. No member may serve more than one year.

THE beginning of scientific training for the Negro pre-school children of the South was marked recently by the opening of the Nursery School–Parent Education Center at Bennett College in Greensboro, North Carolina, one of the two liberal-arts colleges exclusively for the education of Negro women in the United States. The establishment of the center was made possible through a grant of the General Education Board. The ultimate aim of the project is the development of Negro family life in the community.

THE University of Oxford announces that, in response to repeated requests, a Residential Summer Session in Social Studies has been arranged for this summer. The course will extend over a six-weeks period, beginning July 11 and ending August 18. Three main courses of lectures have been arranged, one dealing with Political Theory and Institutions, another with Economic Theory and Institutions, and a third with International Relations. Tuition at the present rate of exchange will approximate $185 for the course. Additional information can be secured by addressing the Delegacy for Extra-Mural Studies, University of Oxford.

IN AN effort to fit its curriculum to the needs of individual students, next fall the University of Rochester will divide all introductory science courses into separate sections for science and nonscience majors. For nonscience majors, mathematics, scientific theory, and unnecessary detail will be de-emphasized, in favor of greater attention to the scientific method of thinking, the history and aims of science, and the place of science in modern life. Laboratory work and

fundamentals will be required as before, but the attempt will be made to keep the average student away from technical bypaths.

A new optional five-year course for engineering students leading to both the degrees of Bachelor of Science and Bachelor of Arts was also announced by Dean du Bridge. Engineers electing this five-year plan will be able to take at least ten elective courses in place of the present three.

THE trustees have approved a colonial-style design for the new million-dollar student-union building to be built on the University of Illinois campus. Preliminary excavations have already begun and occupancy is expected by 1940.

HEALTH SURVEYS have been extended at Cornell University to include an investigation of the causes for scholastic delinquency. Psychiatric examinations and emphasis on mental hygiene now characterize the program of the Department of Hygiene and Preventive Medicine. When the scholastic work of a student falls below par, his case is referred to the medical adviser of the University, who reviews the student's health record, and makes periodic checkings when health is found to be a factor contributing to scholastic delinquency.

A DEFINITE relationship between good scholarship in college and participation in extra-curricular activities is indicated by a study of Phi Beta Kappa students at Colgate University. The study, covering a period of thirty years and conducted by Frank C. Ewart, shows that 16 per cent won letters in some sport, 57 per cent of students' association presidents were members as were also 73 per cent of editors of the college paper, 47 per cent of the yearbook editors, and 63 per cent of Y.M.C.A. presidents. Forty-nine of the 416 Phi Beta Kappas studied were debaters. Comparing those who are successful to a large degree, as recorded by *Who's Who*, Ewart discovered that 11 per cent of members of Phi Beta Kappa are represented, whereas only 1 per cent of the students who were not Phi Beta Kappa members are listed.

EFFORTS on the part of foundations, institutes, and educational organizations to promote international understanding through cultural contacts will be aided by the new Division of Cultural Relations organized in the Department of State of the United States Government. The new division will direct the official international cultural activities of the State Department, seeking above all to co-ordinate the wide diversity of activities which are being carried on throughout the country. These activities will embrace the exchange of teachers and students; encouragement of the distribution of libraries of representative works of the United States and suitable translations of such works into other languages as well as from foreign languages into English; collaboration by the government in international exhibitions; and co-operation in international radio broadcasts. Government leaders feel that as the new Division promotes cultural relationships in encouraging

such activities, it will prove to be a significant instrument for peace.

A JOINT university library, costing two million dollars, to serve Vanderbilt University, George Peabody College for Teachers, and Scarritt College is to be built soon. An appropriation of $1,000,000 from the General Education Board makes possible the project. The new library will be located within a five-minute walk from the most distant classroom on any of the three campuses. Special features of the building include an auditorium with stage, a treasure room for valuable books, a hall of religion, a graduate room, a science and technology reference room, audiovisual equipment, and a microphotography department.

THE classes of seven thousand students of Hunter College, which are now scattered in four buildings, will be centralized in September, 1940, by the completion of a new sixteen-story building. The new building will accommodate five thousand college students and five hundred model-school pupils, now studying in temporarily rented quarters.

The architecture of the building will be conservative and modern with a limestone exterior and a lower base of granite. The structure will be U-shaped, built to allow possible future expansion. There will be 112 classrooms, an assembly room seating twenty-five hundred, a Little Theater with almost eight hundred seats, four gymnasiums, and a swimming pool. Modern acoustical devices will be installed in the cafeteria, reading rooms, and music rehearsal rooms. Recording rooms and voice laboratories will be soundproofed. Facilities for 250,000 books in stacks and 75,000 in the reading rooms will be provided in the two-story library which will seat sixteen hundred students. Ten elevators will ease class-changing traffic, moving one thousand students in five minutes. The estimated cost to complete the college is $6,414,000, to be financed with a Federal grant of $2,886,300 and city funds of $3,527,700.

THE Art of Language is a general language course experimentally developed during the past three years by Fred L. Farley, professor of ancient languages in Stockton Junior College. An early description stated that the course is

> an introduction to peoples through their language and literature. It deals with the psychology of language and the traits of peoples as languages reveal them. The history of language and the comparative characteristics of language occupy a large place in the study.

During the first year the course proved its worth sufficiently well to be allowed as a substitute for required intermediate language. This recognition remains in effect. A few of the units of the syllabus are: language, kinds of language, words as units of language, names of letters, shapes of letters, sounds of letters, words as instruments of speech, the life and death of language. The complete syllabus has been published by photolith process, and copies may be had by college teachers who have a professional interest in it and who will present a critical review of it.

· Editorial · Comments ·

New York Colleges

THE slender volume, *Education for American Life*, is a document which has both local and national significance. It presents a general statement of the findings and recommendations of the Regents' Inquiry into the Character and Cost of Public Education in the State of New York. This independent and outside audit of the policies and administration of New York schools, made under the sponsorship of the Regents of the University of the State of New York, has been in progress since 1935. The publications announced include this general report, an atlas, and the reports of ten special studies.

Particularly interesting to the readers of the JOURNAL OF HIGHER EDUCATION is the section of this general report devoted to colleges and universities. Wisely, in our judgment, the Commission recommends the rigorous limitation of the incorporation of additional general arts colleges and universities because the state is now adequately supplied. Not so clearly valid is the recommendation that no state funds should be appropriated for the establishment of any state-wide system of "junior colleges." The report on higher education will undoubtedly explain the reasons for this seemingly unfavorable attitude toward junior colleges. The objection to their establishment by the Commission, however, may be voiced only against a state-wide system of state support. The Commission recommends against the establishment of a state university; and as a substitute for a state university with its low tuition, it proposes a substantial increase in the number of competitive scholarships provided for high-school graduates from state funds. These are three of several recommendations that interest the writer.

The full report on higher education will be read with interest because New York's state-wide system of education has the leading position of prestige in the nation, and the Regents' Commission has done a careful job of investigation and a thoughtful job of recommendation.

A "Gallup Poll"

THE doctoral dissertation is an earnest document which does not have a high rating in the realm of light reading. The author's chief concern when he comes to write up his findings is to convince the examining committee that he has not overlooked anything. Writing for this ascetic audience does not promote spontaneity and individuality of expression.

Our scouts who spot the materials on higher education in the stream of publications which flows through the offices of our journals have drawn an interesting dissertation to shore. The technique used in gathering the data is a familiar one which doctoral

candidates have applied for years, but which Mr. Gallup has currently introduced to the newspapers. The author is Claude Charleton Bowman; the subject is *The College Professor in America;* the publisher is the University of Pennsylvania. A technical article by the author on the subject appeared in the October JOURNAL.

Mr. Bowman and his staff laboriously located three hundred seventy-five articles in nineteen lay magazines over the last forty-eight years which express attitudes toward the college professor, his conditions of living, and his professional problems. While Mr. Gallup samples his population, Mr. Bowman seems to have examined all of his constituency. About half the articles are written by professors and presidents, and the other half by laymen.

Mr. Bowman was interested in calculating the attitude of the writers of the articles toward the personality of the professor. At some length he presents quotations from the articles showing shades of favor and dislike. On the one hand, he finds expressions like this: "The modern professor is more usually a man of the world . . . than a recluse. . . . His talk is rarely pedantic and far more intelligible than the dialect of the motorist or the jargon of the baseball fan." On the other hand, he quotes the professor as a member of "that cloistered tribe of absent-minded and impractical bigots who strut their miserable hour apart from the haunts of life and men, fretting out lonely, sequestered existences amid the dark walls of the university or the stuffy atmosphere of the laboratory." In general, the judges are against the professorial personality; 60 per cent are against; 12 per cent are neutral; 28 per cent like the professor. Interestingly enough, the professorial authors are 67 per cent against themselves, while the laymen (52 per cent) like them better but are not very enthusiastic about them.

All are rather well agreed, however, that the professor's salary is inadequate; the lay writers feel this more strongly than the professors themselves, who in turn have little doubt about the matter. The writers support the principle of academic freedom for college teachers—73 per cent are favorable. The professors are nearly, but not quite, unanimous on the subject; the presidents are for it but not so emphaticallyly; and the lay writers trail the presidents closely. On the persistent subject of the relative importance of research and teaching in the university, teaching has the edge—52 per cent are for teaching, 22 per cent are for research, and 26 per cent take a middle ground. On the rather distantly related but currently publicized subject of the brain trust in Washington 60 per cent are favorable, 24 per cent are unfavorable, and 16 per cent have no strong feelings either way.

These are interesting bits of data on the intriguing question of just what the public thinks of the professor from which it appears that the professor is somewhat allergic to himself.

W. W. C.

··Reviews··

A Careful Scrutiny

THE EFFECTIVE GENERAL COLLEGE CURRICULUM AS REVEALED BY EXAMINATIONS, *by the Committee on Educational Research, University of Minnesota.* Minneapolis, Minnesota: University of Minnesota Press, 1937. xvi+427 pp. $3.

This volume is useful in at least three different areas. It serves to inform the reader concerning the present state of the General College in the University of Minnesota; it provides an interesting analysis of collegiate curriculum building; and it includes a wealth of material on evaluation and analysis of the results of teaching by means of a carefully elaborated testing service.

The organization of the General College is described in a concise chapter by Malcolm S. MacLean. His definition of general education is: "Education is useful in meeting constantly recurring life problems, whether they be on the job, in the home, at leisure or in the social group." Following this definition, technical courses, even the so-called semi-professional courses are not included in the curriculum of the General College. It would be interesting to find out whether the definition of general education just quoted would not be acceptable for most independent colleges that call themselves liberal-arts colleges. The entire volume leaves upon the reviewer the impression that the significance of the General College lies in the fact that it happily was able to make a fresh start at its educational problem, but that its tendency is in the direction already well established in broad essentials by many liberal-arts colleges. This does not detract in the least from the importance or the significance of the work. It merely serves as encouragement to many of the rest of us who are working toward the same objective from a different starting point. The rapidly increasing number of courses, which were first eighteen, and then twenty-five presented with the close cooperation of the various departmental staffs, grouped in the nine areas of euthenics, psychology, history and government, current affairs, economics, English, the physical sciences, the biological sciences, and the fine arts, affords a curriculum broad and at the same time closely knit together. One is left a little in doubt as to how the innocent and dazed entering student is made certainly aware as to which of these courses fit his needs.

The main portion of the volume is devoted to a careful scrutiny of the nature and results of the testing and evaluation system. Chapters are devoted to each of the main areas of the curriculum, and a wealth of illustrative material is given. The fine critical attitude taken with respect to the testing techniques is very interesting, and indicates an experimental state of mind on the part of all who are concerned with the College. These technical chapters cannot fail to be of interest and help to collegiate teachers who are interested in studying testing procedures.

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A Contribution to Scholarship

THE JESUIT CODE OF LIBERAL EDUCATION, *by Allan P. Farrell, S. J.* Milwaukee, Wisconsin: Bruce Publishing Company, 1938. xviii+478 pp. $4.75.

The Society of Jesus was not organized to keep schools. It was organized to convert "the infidels at Jerusalem." It was the outcome of some 777 years of religious war between the Christians and the Moslems of Spain. It was a crusade,

a missionary crusade, lone-handed and fantastic as ever anything Spanish was, by the man who is perhaps the greatest of all Spaniards—if he is greatest among you who is servant of all the rest.

Ignatius Loyola was born a noble and trained a courtier and an officer in the Spanish army. In the defence of Pamplona he performed heroic feats and was left upon the bastion with a shattered leg. It was long in healing, was improperly set and had to be broken again, and even then the bone protruded and had to be cut off with a saw. Ignatius Loyola was twenty-seven then, and wholly unschooled save in the great tales of Spanish chivalry and in the doings of the court. His convalescence was long. He asked for books; only two could be found for him in the castle, one of them Ludolphus of Saxony's *Life of Christ*, the other, *The Flowers of the Saints*. As he lay there on his sick bed, the deeds of St. Francis and of St. Dominic began to seem to him more wonderful than the feats of any knight-at-arms of whom he had ever heard. And he, why should he not be a champion of the Faith? As he brooded on these great matters, he saw that life is a warfare between the hosts of Satan and the armies of the Lord. He knew to which army he belonged and inwardly he took a vow to be a faithful soldier. As soon as he was able he started off on foot to Montserrat to begin his spiritual knighthood. He hung up his arms and armor before the Altar of Our Lady of Montserrat and on his knees and on his feet he stood guard over them a whole night; then he left them there, putting on instead the arms of Christ. In January, 1523, he set out to the Holy Land alone "to convert the infidels." The Franciscans at Jerusalem met him and informed him that such matters were officially entrusted to them and that he must go right back home. He did so and though he was twenty-nine and largely untaught, he then began a twelve-year course of schooling at Barcelona. At the end of two years' study of grammar his master told him that he was ready to begin the study of the liberal arts at Alcalá. He spent more time in explaining Christian doctrine to people there than on his studies, and the Inquisition made inquiry as to what he was doing. He moved to the University of Salamanca and the Inquisition became more concerned about him. Then he started off on foot to the University of Paris. There he began all over again, entering as a grammar-school scholar, for he found that his training in Latin had not been sufficiently thorough. He spent seven years at the University of Paris. His purpose was in nowise changed; he existed solely for the service of souls. He gathered from his fellow students six of like mind with himself and at daybreak on August 15, 1534, they took their vows and communed together in a little chapel on the hill of Montmartre and so formed their Society. They resolved to go and convert "the infidels at Jerusalem," but the Turks had just taken Rhodes, the Venetians were at war with them, and the seaway to Jerusalem was blocked. In 1540 Pope Paul III wrote the words *Digitus Dei Est Hic* on their application for a charter and the organization was formed. The Society had to train up its own members, but it was as yet not Ignatius' plan to make it an order to conduct academic instruction. His thought for it now was that it should be a highly selected company of about sixty learned and devoted men who should put their services at the disposal of kings and princes and the councils of the Church—a sort of Platonic company of consultative philosopher kings.

But so many young men sought admission to the order that ways had to be found for training them. At first they were sent to study in the universities, the first group being dispatched to Paris to live under a superior in a religious house of their own and to get their training in the university, this in 1540. Then extern students begged to be admitted to the Jesuit College and were taken in about 1546. The next development was that the municipality of Messina asked the Society for teachers to instruct its youth, and a college for extern students was

opened there in 1547. When Ignatius died in 1556, as many as thirty-five Jesuit colleges had been established. In 1640 there were more than three hundred Jesuit colleges for lay folk in Europe, and in 1740 there were more than six hundred such colleges giving instruction.

Francis Bacon could write of their work in his *De Augmentis Scientiarum:* "As for the pedagogical part the shortest rule would be to consult the schools of the Jesuits for nothing better has been put in practice."

The Jesuit Code of Liberal Education, the Ratio Studiorum, by Allan P. Farrell, is an exhaustive and scholarly history and analysis of the teaching and the methods employed in the Jesuit schools during the four hundred years of their existence. No other world-wide unified educational undertaking such as theirs exists or ever has existed. The experiments they have made, the courses they have adopted, the results they have attained, are so strikingly outstanding that my only wonder is why such a book as this was not available in English long ago. I can think of nothing which could have added to its value save the printing of the *Ratio Studiorum* itself in it. It is a contribution to scholarship in which the Society of Jesus may take satisfaction and for which its author must be congratulated and thanked.

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Succinct, Objective, and Orderly

AN ANALYTICAL BIBLIOGRAPHY OF MODERN LANGUAGE TEACHING, *compiled by Algernon Coleman*. Chicago: University of Chicago Press, 1938. xviii+561 pp. $4.50.

The compilers of this volume analyze in succinct, objective, and orderly fashion, 1,125 journal and periodical articles, special reports, books, and Masters' and Doctors' theses, appearing during the five-year period of 1932–37, on the subject of modern foreign-language teaching, at secondary-school and college levels, here and abroad. To the fifty-eight professional publications in America, England, France, and Germany that have been examined, should be added ninety-one Masters' theses and thirteen Doctors' theses, unpublished and relatively inaccessible. More than sixty headings are required for classification of these items, and the names of more than eight hundred authors fill the index. Combined with the preceding volume, covering the years 1927 to 1932, this compilation brings the number of items analyzed for the decade 1927 to 1937 to the astounding total of seventeen hundred. Surely the foreign-language section of the curriculum does not want for interpreters!

The value of this book, however, is not merely in its range, bewildering and awesome as that may seem to the lone reader; it is thorough and dependable in its reportage, keenly observant and relatively unbiased in its rare criticisms, justly insistent upon accuracy and objectivity, painstaking in its citation of significant data, and generally constructive in its comment. In both range and depth, it does honor to the patience, industry, and insight of Mr. Coleman and his editorial associates.

Twice the size of its earlier companion volume, this book is indisputable evidence of a remarkable increase in activity since 1932 in research, publication, and experimentation in language, and of a growing interest on the part of teachers and administrators in establishing factual and experimental bases for language learning and teaching. The reviewer cannot conceive of a language teacher or an administrator for whom this book holds no value. It plumbs the common problem, widens the outlook, and associates the lone worker with his kind.

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Good Reporting

OXFORD LIMITED, *by Keith Briant*. New York: Farrar and Rinehart, 1938. xix+306 pp. $2.50.

As the author says, "for some peculiar reason, Oxford is 'news.'" Well, his book is good reporting, excellent journal-

ism. It is an attempt to describe Oxford for the benefit—and better information—of those who like to read about the wild ways of the undergraduate. Despite many penetrating remarks about curriculum, administration, discipline, and teaching, the book has little value for the American student of higher education. The brief chapter on the Rhodes Scholarship is friendly and tolerant, but it is inaccurate and superficial.

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Toward Synthetic Interpretation

HUMAN AFFAIRS, *by R. B. Cattell and others*. London: Macmillan and Company, 1938. xi+360 pp. $4.25.

Effort continues toward gaining a synthetic interpretation of modern knowledge in terms of modern social needs. Such is the purpose of this book. Appearing in its first printing a year ago, the demand has justified reprinting. The book illustrates one of the best results that come from meetings of such scientific organizations as the American and British Associations for the Advancement of Science. It was during a meeting of the British Association that the three younger scientists who are primarily responsible for this book, all primarily psychologists, discussed the need of developing "a body of opinion among the general public in favor of referring political, social, and cultural problems to the sciences which deal with humanity." It is notable, however, that these younger authors turned to older men, long known in their respective fields, for the major material for the book. Among the fifteen authors of chapters are such names as: Haldane (Society, a Biological Experiment), Lord Raglan (Race and Modern Society), Brackenbury (Medical Progress and Society), Chambers (Psychology in the Industrial Life of the Nation), Blacker (Eugenics and Social Progress), Malinowski (Anthropology as Basis of Social Science), McDougall (Philosophy and the Social Sciences), and Ellis (Eros in Contemporary Life). But younger scientists have also done their part, indeed the most important part, since in addition to their own chapters they provided the plan and saw to it that all is focused on present and future society.

It is not possible to present an adequate review of such a wealth of material under such diverse authorship. Each trained reader will discover conflicting arguments based upon different evidences relating to certain questions. Indeed, many trained readers will want to add evidences and arguments not now in the chapters. But the highly important thing which the book does effectively is to have scholarly scientists combine in endeavors "for the closer co-operation between scientists, legislators, and society itself; a plea for modelling social life after the pattern of scientific truths." Surely we need more of this focusing of separate scientific studies upon man and his life with other men, upon men who must live together and who might do so much better if objective and tested knowledge were used in their planning.

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More than a Miscellany

SCHOOL AND COMMONWEALTH: ADDRESSES AND ESSAYS, *by Henry C. Morrison*. Chicago: University of Chicago Press, 1937. x+238 pp. $2.50.

Mr. Morrison's contributions to the advancement of American education have been numerous, varied, and substantial. He knows from intimate and highly successful firsthand experience the difficulties involved in the actual work of teaching, in the supervision of teachers, and in the administration of school systems. Beyond this, he has been from the outset of his career a keen, clear-headed, independent, and discriminating student of educational and social theory.

This latest book by Mr. Morrison is a collection of papers that he has prepared over a period of more than thirty years. Some of the chapters are largely extracts from the annual reports of the New

Hampshire Commissioner of Education; others were originally contributions to such journals as *The New Humanist*, *Chicago Schools Journal*, and *The Phi Delta Kappan;* others were addresses before educational organizations, including state and city teachers' associations, the Administrative Officers Institute at the University of Chicago, the University of Pennsylvania Schoolmen's Week, the Progressive Education Association, the Convocation of the University of the State of New York, the American Council on Education, and the National Council of Education; some, one of which was a radio address, are published for the first time in this volume. The list suggests the catholicity of Mr. Morrison's interests and the wide range of the audiences to which his work has appealed. In spite of this diversity, however, the book is much more than a mere miscellany of occasional papers. It is a unit, in that all the materials take their significance from the vigorous and virile philosophy of education which lies back of the author's unique and most salutary influence among his contemporaries.

Morrison gives specific attention to the problems of higher education in Chap. XVIII, "The Supervision of College Teaching," which is one of the essays hitherto unpublished. While there are "many books which deal with the problem of college education as such," and while "there is a good deal of literature dealing with the supervision of teaching in general," there is as yet no systematic treatise on the supervision of college teaching. Supervision in this field, the author believes, is most important on the junior-college level. Here the problems of instruction are, in general, much more closely related to the secondary school than to the university. The student's progress "is still critically dependent upon the teaching which he encounters," and yet "this is the very period in which courses are most likely to be intrusted to untried and untrained young instructors" (page 151).

While the author believes that junior-college teachers should have specific pre-service training in the art of teaching, he recognizes that "for a long time to come" their training will probably have to be given on the job. A second problem of college supervision is not limited to the junior-college level or to the beginning teacher. This is the problem of co-ordinating the instruction that is given by different teachers. Sets of rules legislated by the faculty provide at best only a mechanical co-ordination, "a very inexact form of factory procedure." Effective co-ordination must be "a matter of qualified personal leadership," effected through individual and staff conferences. It must be based, not upon obedience to orders, but upon a reasoned conviction growing out of evidence.

The clear trend of Morrison's argument is toward the conclusion that the oversight and direction of college teaching should be intrusted to a highly qualified supervisor. This person should be: first, a teacher of acknowledged capacity; second, abreast of modern educational science; third, "personally mature, not past the vigor and enthusiasm of early manhood, but not a tyro appointed to his place because nobody else is willing to undertake the task" (page 158). He should work closely with the student-personnel service of the college, the important duties of which the author recognizes and defines.

The conception of secondary education with which Morrison's name is associated carries with it by implication a conception of the field of higher education. The secondary period extends from the time when the primary learnings are mastered (normally at the beginning of the fourth school year) "to the point at which the individual has, in fact, become personally mature, as determined by evidence that he can be trusted to find his way about in a complex civilization, evidence that he has himself become civilized." The university should be "a place for the mature student who has found an intellectual interest and is capable of following it in the spirit of scholarship and science to the point at which he is master of his chosen field" (pages 64–65).

The vast upward expansion of mass

education, first into the high schools and now into the higher institutions, Morrison attributes primarily—and, we believe, quite properly—to economic factors. He recalls that the first significant expansion of the high-school enrollment followed the financial panic in 1893. The depression of the 1930's extended the movement to the late adolescent and adult levels.

The present brief review has been limited to the position that the author takes on some of the more important problems of higher education. Problems of equal significance in the fields of elementary and secondary education, administration, school finance, the curriculum, and educational theory in the large are discussed with equal vigor and with penetrating insight. All in all, the book is an important and most timely contribution. It should have high value as a basis for discussion and further study in college and adult classes.

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A Book for All Counselors

STUDENT GUIDANCE TECHNIQUES, *by Donald G. Paterson, Gwendolen G. Schneidler, and Edmund G. Williamson.* New York: McGraw-Hill Book Company, 1938. xviii+316 pp. $3.00.

All educators who profess to advise students whether in secondary or higher education should read this book. To get the full value from it, however, Williamson and Darley's *Student Personnel Work* should be read first as this treatise is in the nature of a supplement.

After considering briefly general guidance and techniques, the authors devote the large part of the book to a discussion of various types of diagnostic instruments, such as tests, questionnaires, and rating scales. The method of organizing the information strikes this reviewer as most effective. It begins by establishing five categories of measurement tools followed by a description of those outstanding in each group, giving the purposes for which they were designed and their reliability and validity.

This method of organization should not give the impression that a mere catalogue of tests is presented. Rather the authors advance a monograph showing the importance, value, and use of instruments in the guidance of students. Particularly significant is the chapter on "Personality Tests and Questionnaires" wherein constructive suggestions are made for the development of instruments in this debatable field of guidance.

Especially valuable are the authors' pungent criticisms of many widely held but poorly thought-out personnel principles. In speaking of educational and vocational guidance the aim of "thoughtful planning rather than wishful thinking" (page 7) is established; and is followed by this admonition, "It is decidedly unfair to stimulate students to think of their occupational future unless they have first been given an understanding of their own assets and liabilities" (page 27). Again in a discussion of records this important principle is emphasized, "that the cumulative record is a method for recording data and not a substitute for such data" and further that the record "card is not a mechanical substitute for diagnosis and counseling" (page 20). Personnel workers should give considerable thought to the lines concerning a psuedo philosophy of guidance which encourages students "to plan their educational programs solely in terms of ambition, desires, hopes, and irrational faith in higher education as the open sesame to success in life" (page 266).

The final chapter should be of great value to persons who contemplate entering the guidance field. It enumerates the qualifications for counselors and should excite considerable interest and discussion.

The authors have contributed another vastly significant, and above all, useful volume to the field of student personnel service. The reviewer hopes that they will continue their contributions, giving special emphasis to adjustment techniques, as this volume stresses primarily diagnostic measures.

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